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WAGES AND JOBS IN THE 1980s:
Changing Youth Wages and the Declining Middle

by

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ABSTRACT

Drawing on two unique Statistics Canada surveys, the 1981 Work History Survey and the 1986 Labour Market Activity Survey, this study reports on changes in the distribution of jobs by hourly wage rate between 1981 and 1986. The results show some increased concentration of jobs in two segments of the wage distribution -- the bottom and the upper middle. Changes in the structure of employment (the growth in jobs in service industries and a changing occupational mix) account for some of these changing wage patterns. However, even though the restructuring of jobs among industries and occupations was substantial over the period, most of the change in the wage distribution is left unexplained after accounting for this phenomenon. The overall change is more related to changes in the wage distribution within industries and occupations.

Much of the observed shifts in the overall wage distribution are related to an economy-wide decline in relative wages paid to young workers, and to a lesser extent, an increase in the relative wages of older workers. The job opportunities available to young workers in 1986 were much more concentrated at the very bottom of the wage distribution than was the case in 1981. Wages among the young displayed flexibility over this period, coinciding with a declining unemployment rate during 1984-86. Possible reasons for the decline in the relative earnings of the young are discussed, including labour market "crowding" due to the large cohort of young workers, the lingering effect of the recession on the demand for labour in entry level jobs, and other changes occurring in the youth labour market. A regional analysis of the changing wage distributions is also included.

Key Words: wages; jobs; labour market;employment; young workers;

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TABLE OF CONTENTS

INTRODUCTION 1

HIGHLIGHTS 8

METHODOLOGY AND DATA SOURCES 11
- Change in what? Wage Rates, Earnings or Income 11
- Measuring Change in the Wage Distribution 13

THE CHANGING WAGE DISTRIBUTION: TRENDS FOR DEMOGRAPHIC GROUPS 24
- General Trends 24
- Trends by Age and Sex 26
- The Growth of Part-Time Employment 30

THE IMPACT OF INDUSTRIAL RESTRUCTURING ON THE WAGE DISTRIBUTION 34
- The Growth in Low and High-Paying Jobs 35
- The Changing Industrial Mix of Jobs 41
- The Wage Distributions in the Industrial Sectors 43
- Decomposing the Change in the Wage Distribution 46

THE CHANGING OCCUPATIONAL MIX AS IT AFFECTS THE WAGE DISTRIBUTION 50
- The Growth of Low and High Wage Jobs in Occupations 51
- The Two Components of Change in the Wage Distribution 56
- Occupational Change Within Industrial Sectors 60

YOUTH: THE EFFECT OF INDUSTRIAL AND OCCUPATIONAL RESTRUCTURING ON THEIR WAGES 62
- The Industrial and Occupational Restructuring of Jobs for Youth . . . 62
- Changing Wage Distributions Within Industries and Occupations 64
- A Decomposition of Change in the Wage Distribution Among the Young . 66

REGIONAL PATTERNS 69
- An Analysis of Five Regions 69
- The Changing Wage Distribution in Ontario 76

CONCLUSION 88

APPENDIX I 99

APPENDIX II 110
- Statistical Tables 110

BIBLIOGRAPHY 145

LIST OF CHARTS

1. Selected Economic Indicators:
   Capacity Utilization Rates, Manufacturing, 1971-87
   Gross Domestic Product (1981 $), 1976-86
   Unemployment Rates, 1975-87
   Average Income of Individuals (1986 $), 1980-1986

2. Cumulative 1981 and 1986 Wage Distribution for F.T.E. Jobs

3. Percentage Change in Relative Mean Hourly Wages by Age, 1981-86

4. Change in Shares of Jobs, by Wage Level, 1981-86

5. Index of Growth in Paid Employment by Industry, 1978-87

6. Net Change in the Number of F.T.E. Jobs, by Wage Level, Goods-producing and Services Sectors, 1981-86

7. Percent of F.T.E. Jobs in the Top Three Wage Levels, by Industrial Sector, 1986

8. Percent of F.T.E. Jobs in the Bottom Three Wage Levels, by Industrial Sector, 1986

9. Industry-based Decomposition of Change in the Wage Distribution, 1981-86

10. Net New Jobs in Occupations, by Wage Level, 1986

11. Occupation-based Decomposition of Change in the Wage Distribution, 1981-86

12a. Industry-based Decomposition of Change in the Wage Distribution, 16-24 Age Group, 1981-86

12b. Occupational-based Decomposition of Change in the Wage Distribution, 16-24 Age Group, 1981-86

13. Unemployment Rates, Provinces, 1979-87

14. Percentage Change in Relative Mean Wages, by Age and Regions, 1981-86

15. Unemployment Rates, by Age, Ontario, 1975-87

16. Percentage Change in Relative Mean Hourly Wages by Age, Ontario, 1981-86

17. Change in Relative Mean Earnings, Full-time Full-year Workers, by Age, Ontario, 1977-86

18. Population and Labour Force, by Age, 1975-87

19. Unemployment Rates and Employment Population Ratio, Young Workers, 1980-87

20. The Relative Mean Wage, Percent Change Relative to 1981, Full-time Only by Age Group, 1977-86

LIST OF TABLES

1. Sensitivity of the Change in the Wage Distribution to the Choice of an Inflator, 1981-86

2. Net Change in Full-time Equivalent Jobs by Wage Level, 1981-86

3. Change in the Distribution of F.T.E. Jobs by Wage Level, 1981-86

4. Change in the Distribution of F.T.E. Jobs by Wage Level and Sex, 1981-86

5. Net Change in the Number of F.T.E. Jobs, by Industry Sector and Wage Level, 1981-86

6. Percent Distribution of Full-time Equivalent Jobs by Major Sector, 1981-86

7. Growth in Full-time Jobs by Occupation, 1981-86

8. Major Occupational Contributions to Change in F.T.E. Jobs by Wage Level

9. Change in the Distribution of F.T.E. Jobs by Wage Level, Ontario, 1981-86

10. Change in the Wage Distribution of F.T.E. Jobs by Age, Ontario, 1981-86

APPENDIX I:

I-1 Comparison of Census and SWH/LMAS Earnings Distributions, All Full-time Paid Workers, 1981-85 and 1981-86

I-2 Comparison of Census and SMW/LMAS Earnings Distributions, All Full-time, Full-year Paid Workers, 1980-85 and 1981-86

I-3 Comparison of SMH/LMAS Wage and Earnings Distributions, 1981-86

APPENDIX II:

A-1 Change in the Wage Distribution of F.T.E. Jobs, by Age and Sex, 1981-86

A-2 Change in the Distribution of F.T.E. Jobs by Wage Level, Age and Education, 1981-86

A-3 Net Change in Full-time and Part-time F.T.E. Jobs by Wage Level, 1981-86

A-4 Change in the Distribution of Full- and Part-time F.T.E. Jobs by Wage Level, Age Group 16-24, 1981-86

A-5 Definitions of Eight-Industry Sectors

A-6 Changes in Full-time Equivalent Jobs in Goods-producing and Services Sector, 1981-86

A-7 Detailed Industries Contributing a Change of More Than 10,000 Net Jobs to a Wage Group, 1981-86

A-8 Change in the Wage Distribution in F.T.E. Jobs by Industrial Sector, 1981-86

A-9 1986 Hourly Wage Rates Statistics for 52 Industries (F.T.E. Jobs)

A-10 Industry-based Decomposition of Change in the Wage Distribution, F.T.E. Jobs, 1981-86

A-12 Definitions of the Occupational Classifications

A-13 Net Change in the Number of F.T.E. Jobs, by Occupation and Wage Level, 1981-86

A-14 Change in the Wage Distribution of F.T.E. Jobs, by Occupation, 1981-86

A-15 Occupation-based Decomposition of Change in the Wage Distribution, F.T.E. Jobs, 1981-86

A-16 Percent Distribution of Full-time Jobs among Industry Sectors, by Age and Sex, 1981-86

A-17 Percent Distribution of Full-time Jobs among Occupations, by Age and Sex, 1981-86

A-18 Change in the Wage Distribution of Full-time Jobs, by Industry, 16-24 Age Group, 1981-86

A-19 Change in the Wage Distribution of Full-time Jobs, by Occupation, 16-24 Age Group, 1981-86

A-20 Change in the Wage Distribution of F.T.E. Jobs, by Industry, 25-34 Age Group, 1981-86

A-21 Change in the Wage Distribution of F.T.E. Jobs, by Occupation, 25-34 Age Group, 1981-86

A-22 Change in the Wage Distribution of F.T.E. Jobs, by Industry, 35-49 Age Group, 1981-86

A-23 Change in the Wage Distribution of F.T.E. Jobs, by Occupation, 35-49 Age Group, 1981-86

A-24 Change in the Wage Distribution of F.T.E. Jobs, by Industry, 50 and Over Age Group, 1981-86

A-25 Change in the Wage Distribution of F.T.E. Jobs, by Occupation, 50 and Over Age Group, 1981-86

A-26 Industry-based Decomposition of the Change in the Wage Distribution, Full-time Jobs Only, 16-24 Age Group, 1981-86

A-27 Occupational-based Decomposition of the Change in the Wage Distribution, Full-time Jobs Only, 16-24 Age Group, 1981-86

A-28 Change in the Wage Distribution of F.T.E. Jobs, by Region, 1981-86

A-29 Change in the Wage Distribution of Full-time Jobs, by Age and Region, 1981-86

A-30 Change in Relative Mean Wages, by Age Group, 1977-86

INTRODUCTION

The focus of this study is jobs and the hourly wages paid in them. It employs new information on jobs obtained from two very novel surveys to examine changes in the distribution of jobs by hourly wage rates in Canada between 1981 and 1986, a period in which Canadians experienced the worst recession since the depression of the thirties. Between the start of the recession in 1981 and 1983, unemployment levels had risen from 7.5% to almost 12% and total employment had fallen by 2.5%. After 1983, however, growth rates turned positive again and employment levels began to rise. By 1986, unemployment had fallen to 9.6% and total employment had reached 11.6 million, an increase of 8.4% since 1983, and 5.7% above the pre-recession 1981 level. Measured by the employment creation standard, the Canadian recovery, like that of the U.S., was a success. In Europe, net employment growth during the eighties has remained close to zero or even negative despite recovery (Auer, 1988).

However, Canada's very success in increasing the quantity of jobs during the recent recovery has raised questions about their quality. Concern has been expressed in the media, social policy circles and the labour movement that the jobs added to the economy during recovery have been mainly low-wage jobs. The fear is that Canada has been undergoing a change in wage structure that is making it more difficult for many families and individuals to get by on employment income alone.(1)

One reason for this concern is that real average wages and incomes (i.e. wages and incomes adjusted for inflation) continue to lag slightly behind pre-recession levels.(2) But the main reason is a widely held view that the lingering, relatively permanent, effects of the recession accelerated long term trends believed to be altering the distribution of wages, changes captured in Robert Kuttner's (1983) evocative imagery of a 'declining middle class'. According to Kuttner, emergent patterns of employment are creating a wage distribution resembling an hour glass with wage earners concentrated at both the top and the bottom. Other variants of the declining middle thesis abandon the hour glass imagery to emphasize a general shift of employment into the

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(1) See, for example, Canadian Council on Social Development (1987:5).

(2) Real average weekly earnings (as measured by the industrial composite) were 1.4% lower in 1986 than in 1981, and average annual incomes of individuals was 1.0% lower.

wage distribution (e.g. Bluestone and Harrison, 1985) but the concern is similar: it is not so much average wage levels that are at issue, but long term trends in the distribution of wages. The reasons for this concern have to do with the kinds of jobs that are being created as we move from an economy where a large proportion of jobs are in manufacturing or other goods industries to one where service sector jobs are overwhelmingly predominant. Kuttner argues that wages and earnings are typically clustered around the middle of the wage distribution when manufacturing jobs are numerous. In economies where most employment is service-based, this changes. Wages in the growing service and new high technology industries tend to be clustered at the top and at the bottom of the wage distribution, it is argued.

Numerous researchers since Kuttner have attempted to establish whether this is the case and reached varied conclusions.(3) The concern with the effects of occupational or industrial restructuring -- especially the growth in services -- on the wage distribution continues. The share of employment in the goods-producing industries has been declining since the fifties but, until recently, this was not because manufacturing employment was declining but simply growing less quickly than employment in services (Picot, 1986). By 1986, in contrast, total employment in goods production had still not returned to pre-recession levels. Instead, all of Canada's net gain in employment between 1981 and 1986 was in the service industries. Two highlights drawn from our analysis later in the paper emphasize this point.

- o All major goods-producing sectors had fewer jobs in 1986 than in 1981, while all major service sectors -- except for public administration -- experienced growth in the 6% to 15% range.

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(3) *Most work on this subject has been in the U.S. Some analysts have found support for some or all of the ideas outlined by Kuttner (e.g. Lawrence, 1984; Harrington and Levinson, 1985; Bluestone and Harrison, 1985; Bradbury, 1986). Others suggest there has been confusion about exactly what the question is being asked and what measures should be used to answer the question. These authors in some cases find no support for the "declining middle" hypothesis (e.g. Rosenthal, 1985) but more often they argue that inappropriate measures have been used and this has created incorrect impressions and confusion about what is really occurring to either the distribution of weekly wages or annual earnings (e.g. McMahon and Tschetter, 1986; Kosters and Ross, 1988). Furthermore, some authors have interpreted the "declining middle" debate not in terms of the types of jobs being created but in terms of income inequality (e.g. Leroy, 1987, Levy, 1987; Leckie, 1988). These are critical issues to which we return in our discussion of methodology.*

- o As a result, the share of employment in the service sector increased by 3 to 4 percentage points in just five years. There was almost as much change over a five-year period as occurred in the entire decade of either the 1960s or the 1970s.

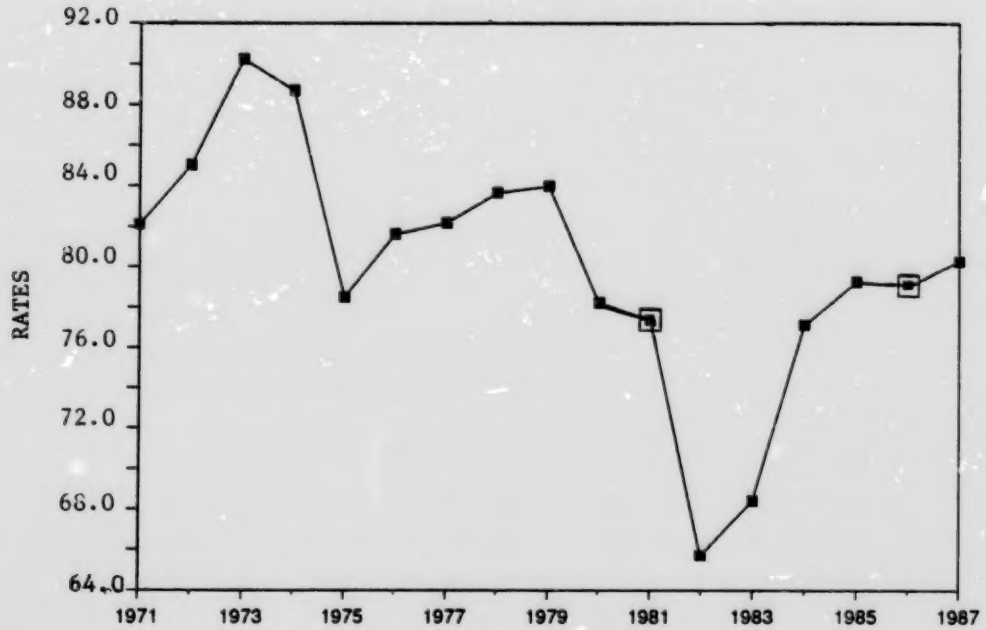
This shift of employment from goods to services and other trends such as the increase in part-time work (described below) are the main reasons usually invoked for the claim that the recession and its recovery has brought important changes in the wage distribution.

Our first purpose, then, is to establish what changes if any occurred to the distribution of jobs by hourly wage rate during this very unique period of both recession and recovery and whether these changes can be attributed to the industrial or occupational restructuring of jobs, changes in the full-time/-part-time mix or other factors. This study is unique in that it focuses not on what individuals earned during a week or a year, as do most studies of this type, but rather on the jobs held in the economy, and their hourly rates of pay. And it is the types of jobs available that is important in the "declining middle" debate. This is possible because of the unique data available for 1981 and 1986, as described in the methodology section. But the time period employed in an analysis such as this is also important.

Significant business cycle fluctuations can influence the results. Employment in goods-producing industries is more affected by cyclical downturns and recoveries than employment in most service industries. It is important, then, to avoid periods which are dominated by a recession (say 1981-83) or an economic upswing (say 1983 to 1986 or 1988). The 1981-86 period is not unreasonable for an analysis of the changes in the wage distribution and the effect industrial and occupational restructuring has had on it. This period encompasses both the downturn and a substantial, although in some cases, partial recovery. Selected economic indicators shown in Chart 1 demonstrate

Chart 1. Selected Economic Indicators

CAPACITY UTILIZATION RATES, MANUFACTURING, 1971-87



GROSS DOMESTIC PRODUCT (1981 $), 1976-86

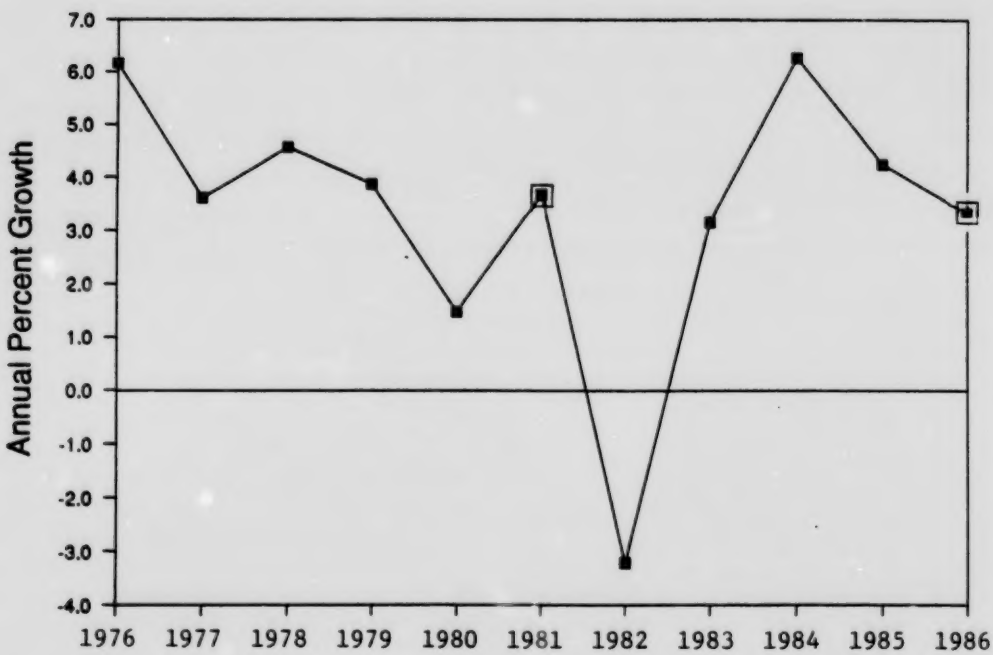
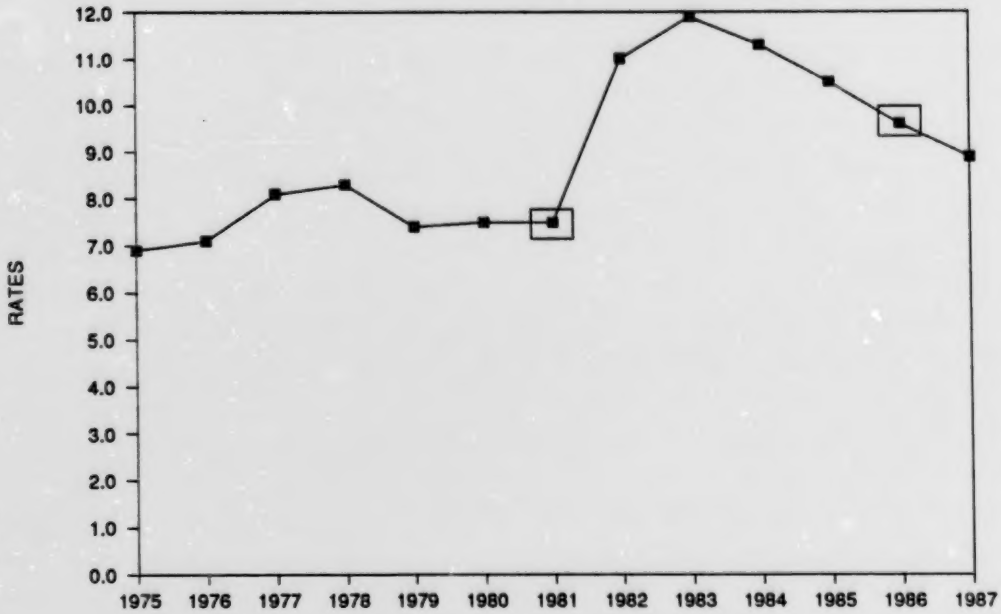
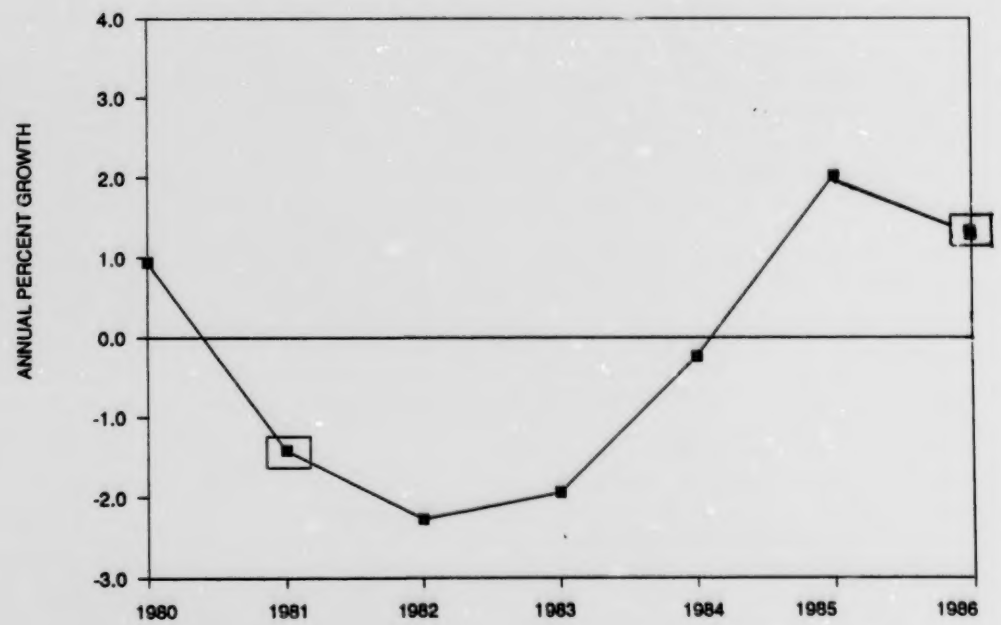


CHART 1. SELECTED ECONOMIC INDICATORS - CONCLUDED

UNEMPLOYMENT RATES, 1975-1987



AVERAGE INCOME OF INDIVIDUALS (1986 $)



the cyclical fluctuations over the period.[4] The continued recovery in 1987 and 1988 may influence the results to some extent, particularly in some regions (e.g., the western provinces) or industries (e.g., the natural-resource industries) where the recovery was less advanced in 1986. In order to determine if the major findings hold in a region which did have an advanced recovery by 1986, a separate analysis is conducted for Ontario. The findings for Ontario are very similar to those for Canada as a whole over the 1981-86 period. It seems unlikely that the major findings will be reversed by the continued recovery (in 1987 and 1988), although the observed change in the shape of the wage distribution will obviously be somewhat different for different periods (e.g., 1981-86 as compared to 1981-88). Nonetheless, the analysis spanning 1981-86 will, we believe, provide valuable insights into changes in the wage distribution in the very volatile 1980's.

The first major goal of the paper, then, relates to the overall change in the wage distribution and its relationship to occupational and industrial restructuring over the 1981-86 period. One particular group, however, has been inordinately affected by both economic and demographic changes during the 1980's -- young people. The second major goal of the paper is to focus on changes in jobs and wages among youth in the 1980's.

The labour market for young people has always been volatile. The entry into the labour market often involves fairly rapid movement among jobs as individuals acquire experience and seek an acceptable place. Adjustment

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(4) The significant impact of the recession had not yet been observed in 1981, and by 1986, following three or four years of recovery and expansion, major indicators were moving toward their pre-recession levels. Capacity utilization in manufacturing was almost identical in 1981 and 1986; and real gross domestic product was up 14.3% at the end of this period. Unemployment which was at 7.5% in 1981 and rose to 12% in 1983 was along its downward recovery path, falling to 9.6% in 1986. Recovery was more pronounced in some industries than others, however, The natural-resource based industries, although having experienced some recovery, by and large were still suffering from low demand in 1986, and recovery was more evident in 1987 and 1988. Employment levels remained well below the pre-recession (1981) level in this sector, however (chart 6). Most parts of manufacturing (e.g., autos) had recovered by 1986, and the recessionary effects on employment in business, distributive and consumer services had long since disappeared. Thus, it is difficult to establish exactly what years are at common points in the business cycle for the economy as a whole. To complicate matters, some effects (e.g., part of an employment downturn or changes in demand) which may appear to be cyclical can develop into longer-lasting structural change. As expansion continued in 1987 and 1988, the major observations will be reassessed as new data become available from the Labour Market Activity Survey.

processes which occur in the labour market often affect young people more than others. As hiring slows or stops in one industry or occupation and hiring expands elsewhere, it is among the young that the change is most readily observed. Such changes can influence the wages which young people receive.

Furthermore, when aggregate demand is low, as it was during the 1981-82 recession and subsequent years, it is often the young who are disproportionately affected. Entry level hiring stops, and lay-offs are more concentrated among young people due to seniority provisions or because employers want to keep the more experienced and hence more productive middle-aged workers. And demographic phenomenon have added to the complexity of the youth market. A very large cohort of young workers was entering the labour market in the late 1970's and early 1980's. The supply of young workers rose steadily during the 1970's, but had peaked by the late 1970's and was declining to 1986. This supply-side phenomenon affected unemployment and earnings among young people.

The 1981-86 period was, then, an exceptionally volatile one for this population group, and changes in the wage distribution (and relative wages rates) of young people are a major part of the story presented in this paper.

Our main conclusion is that the distribution of wages (across all age groups) did become somewhat more polarized over this period and while industrial or occupational restructuring contributed to the polarization, this was not the primary cause. Instead, the main change, which occurred across the entire economy, was a decline in the relative wage rates in jobs held by younger people, on one hand, and on the other, if anything an increase in the relative wage rates in jobs held by middle-aged workers. These and other highlights are discussed briefly in the section that follows.

HIGHLIGHTS

- Between 1981 and 1986 net job creation was concentrated at the very bottom and in the upper-middle levels of the wage distribution. The result was a modest decline in the share of employment in the middle and a larger decline in the lower-middle levels of the distribution.

- This change in the shape of the wage distribution is not explained by the rise in part-time employment. The same pattern of change in the wage distribution was observed in full-time jobs as in all jobs.

- There was substantial change in the industrial mix of jobs by historical standards. It was in the direction expected: increasing job opportunities in the services - notably consumer services and health/education/-welfare - and a declining share of jobs in the goods-producing sector. However, this redistribution of jobs among industries accounted for relatively little of the total change in the shape of the wage distribution (increased share of jobs at the bottom and upper middle of the distribution). Most of the change originated from a changing wage structure within industrial sectors. At least for this period, the view that industrial restructuring is the main source of change in the shape of the wage distribution is not substantiated.

- The same conclusion was reached regarding changes in occupational structure. There was substantial occupational redistribution over the period, but this too accounted for relatively little of the total change in the wage distribution. The change in the wage distribution was related not so much to the rapidly growing number of managers and service workers, and declining number of blue collar workers, as to the wage changes occurring within occupational groups.

- Most change in the mix of jobs among industries and occupations occurs among young people. Hiring at the entry or near entry level slows or stops in declining industries or occupations, and takes place in expanding ones. Also, redistribution which occurs through lay-offs and rehiring is concentrated among the young. Thus, if there was a strong effect of industrial or occupational restructuring on the wage distribution, it would be found in jobs occupied by young people. Again, however, such

restructuring accounted for some but not a lot of the change in the wage distribution among the young.

- o One of the major changes in the wage distribution was related to relative wages among age groups -- particularly declining relative wages among workers under 35.

- o The most dramatic change was the downward shift in the distribution of wages paid to workers aged 16-24. This downward shift was widespread, occurring in all industrial sectors, occupational groups, regions and all levels of education. The increasing importance of part-time work accounted for little of this shift.

- o A similar but not as substantial, downward shift in the wage distribution among 25-34 year-olds was also observed, and it too was widespread. Among workers over 35, the shift in the distribution was less noticeable, but that which occurred was in the opposite direction - upwards.

- o There were also distinct provincial and regional patterns. Compared to the wage growth in Canada as a whole, Ontario did very well as most of the movement was into the top of the wage distribution. The change to the wage distribution in Quebec resembled that for Canada as a whole, and elsewhere the pattern was one of an increasing share of jobs predominately at the bottom.

- o The degree of recovery by 1986 from the 1981-82 recession varied considerably among the regions. Ontario's recovery was quite advanced by 1986; the overall unemployment rate had fallen to almost its pre-recession level, and youth unemployment was below the 1981 value. For this reason a separate analysis was conducted for that province. All the major findings reported in the highlights above were evident in Ontario. Although average wages grew more quickly in that province than for Canada as a whole, the changes in the <u>shape</u> of the distribution were similar to that reported above. As well, a decline in the relative wages of the young was quite evident, and industrial restructuring of employment, while substantial, explained little of the change in the wage distribution.

Systematic study of the questions addressed in the introduction is recent and most studies to date have been American in origin. Anyone familiar with these American studies will attest that they provide no clear

resolution to the debate.(5) The reasons for this are in the first instance purely methodological: a variety of data sources, measurement strategies, and time periods chosen for study have yielded a great variety of conflicting results. But the methodological differences also reflect conceptual differences in the way the problem is posed, differences that have not always been well understood. In the following section, we outline some of the issues in addressing these questions, and how and why we approached the analysis in the way in which we did.

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(5) *For reviews of this literature, see Blackburn and Bloom, 1987; Leckie, 1988.*

METHODOLOGY AND DATA SOURCES

Change in what? Wage Rates, Earnings or Income

As Kosters and Ross (1988) observe, the debate over the declining middle has been about the proliferation of jobs with low wage rates, whereas most empirical studies have focused on changes in the distribution of earnings (either weekly or annual). The distribution of earnings may change because of changes in wage rates, hours worked (weekly or annually) or both. Thus, the distribution of earnings of individuals may not change in the same manner as the distribution of hourly wages in jobs.(6) Individuals may earn less not because they are paid lower hourly wages but because they work fewer hours. Alternatively, when wages decline they may maintain earnings levels by working more hours. Similarly, changes in earnings may not be mirrored exactly in changes in income. Changes in investment, pension, self-employment or other non-labour sources of income can affect an individual's total income level. Finally, family income, the usual standard by which economic well-being is measured, may remain stable or change independently of changes in wages, earnings or the distribution of individual incomes. If the earnings of one member declines, families might maintain their incomes by having other members work more hours.

Data Sources:

This study concentrates on jobs and the hourly wages paid for them. This is possible because of two unique surveys conducted by the Special Surveys Section of the Household Surveys Division of Statistics Canada in 1981 (the Work History Survey) and 1986 (the Labour Market Activity Survey). Both were supplements to the labour force survey. Because respondents reported on all jobs held during a year (1981 or 1986), the job can be treated as the unit of analysis rather than the persons holding them. A job change occurs in the data when the respondent changed employer.

The information reported on the job includes, among other things, wages or salary paid, time worked at the job in hours per week and weeks in the year,

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(6) *This is in fact the case over the 1981-86 period, as shown in Appendix I.*

industry and occupation of the job. The questions used to collect this information were virtually identical in the two surveys, so that data are comparable. The industry and occupation of the jobs in the 1981 survey were originally coded using the 1971 occupational (SOC) and industry (SIC) codes, but were recoded for this study using the 1981 SOC and SIC to provide comparability with the 1986 data. This analysis was restricted to jobs providing paid employment in the non-agricultural sector of the economy. Jobs in agriculture were excluded. Given these restrictions, the sample sizes were 52,000 persons reporting on jobs in the 1981 survey, and 54,000 in the 1986 survey.

All earnings, whether reported on an hourly, weekly, monthly or annual basis, were converted to wages per hour using the information on time worked in the job. The information on hours worked in the job also allowed all jobs to be converted to full-time, full-year equivalent (or full-time equivalent, FTE jobs). Thus, each job -- whether full-time or part-time, whether lasting one month or 12 months -- was given a weight which indicated what proportion of an FTE job it constituted. One FTE job represents 2,080 hours of labour, the number of hours worked during a year in a 40 hours per week job. This weight, then, was simply the hours worked in the job divided by 2080. This means in essence that what is being measured is the number of hours of labour that was provided in each industry (or occupation) at a given wage rate during a year, and the number of hours of work at given wage rate procured by persons of a given age and/or sex. The wage distributions reported are distributions for FTE jobs. The wage distributions can, of course, be converted to earnings distribution by summing all jobs held by individuals.

The measure of labour earnings used in this study -- i.e., the hourly wage rate in all full-time equivalent jobs in the economy for 1981 and 1986 -- is unique in Statistics Canada. Such data are currently available only for these two years from the surveys mentioned earlier, although the Labour Market Activity Survey will be conducted annually for the foreseeable future. This measure is conceptually different from the "average weekly earnings" obtained from the establishment-based Survey of Employment, Payroll and Hours (SEPH). The surveys used here provide microdata on the hourly wage rates in a representative sample of jobs held during the year in the economy, and SEPH aggregate data on the average weekly earnings of a representative sample of persons employed in various industries during a particular week. The measure used here is also conceptually quite different from the income data reported from the Survey of Consumer Finances. That measure reports annual income of

individuals or families, which includes both labour earnings and non-labour sources of income. For purposes of this study, the hourly wage rate data on FTE jobs is ideal, since it allows us to focus on jobs (not individuals), and also allows the analysis of distributions, rather than averages only.

The distinction between wage rates and earnings has often been represented as a conceptual problem in the past. But until now, it has been difficult if not impossible to study the extent and nature of the problem empirically. These unique data sources allow us to study both hourly wage rates and earnings of the same individuals. In fact, there is a surprising difference between the change in the hourly wage rate distribution and the change in the earnings distribution between 1981 and 1986. These differences are discussed in Appendix I, and interested readers are urged to review this appendix.

Measuring Change in the Wage Distribution

Changes in Shape VS Changes in Level

This analysis is primarily concerned with changes in the shape of the wage distribution. Has there been a shift in jobs from the middle of the distribution to the top or the bottom? We are not concerned with whether wages in general have been rising or falling in real terms (i.e. after adjusting for inflation). Instead we are concerned with trends in the distribution of relative wages.(7) If wages are converted to "real" wages by, say, deflating 1986 wage levels using the consumer price index (CPI), and the 1981 and 1986 distributions are then compared, a rise in, say, the number of low-paying jobs could be due either to (1) a decline in the level of real wages or (2) a change in the shape of the wage distribution (say a shift out of the middle to the bottom). It is only the latter sort of changes that concern us here. So the issue is not whether wages have been losing ground to inflation. The inclusion of this latter point would only confuse the findings regarding increasing numbers of low or high paying jobs. We want to know whether forces at work

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(7) *However, radical shifts in relative wages for a particular group would also mean a radical shift in real wages. Since real average weekly earnings economy-wide fell 1.4% between 1981 and 1986, declines in relative wages will only slightly underestimate declines in real wages. Conversely, increases in relative earnings will slightly overestimate increases in real wages.*

over the period of recession and recovery altered the shape of the wage distribution in Canada and, hence, our concern with relative wage levels.

Methods of Comparing Shapes of Distribution

The most common studies of change in the shape of earnings or income distributions are income inequality studies. These are basically concerned with the share of total income or wealth going to a fixed proportion of the population. Inequality is said to have increased for example, when the share of income of the top 10 percent of the population increases. The condition of the middle class is seen as declining when the share of income going to the middle third (or fifth) of the population declines. Both the theory and methods for the study of inequality used in this sense are well developed and understood (see Love and Wolfson, 1976, Cowell, 1977). Measures used when comparing distributions in this way are quantile shares of income, Gini coefficients, coefficient of variation, variance of logarithms, and others. Relative earnings in current dollars are employed in these studies and no price deflation is needed. Since earnings are usually scaled by the mean wage, implicit in these studies are wage deflations, usually using the change in mean earnings to deflate earnings levels implicitly between years.

In these traditional inequality studies, the "middle class" would be defined as the set of all jobs that fall in the middle fifth or middle third of the wage distribution. One could then ask a question of the sort: "Is the condition of the "middle class" improving or deteriorating over time, i.e. is their share of total wages, earnings or income increasing or declining"?. In this approach, the relative size of the middle class, by definition, does not change so that one cannot answer questions of the sort: "Is the "middle class" getting smaller or larger"? Nor does this approach address the more general concern over the proliferation of low wage jobs (are they increasing or declining?).

Instead of the share of earnings (wages) going to a fixed proportion, say 20%, of jobs, the concern in this study is with the share of jobs that fall within a fixed (relative) wage interval[8] (e.g. a fixed proportion of the

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(8) It is possible to have the share of wages (or earnings) going to, say, the middle 20% of workers remain constant over time while the share of jobs (or earners) found in the middle, as defined by fixed relative wages,

median). This is the approach generally used in the literature on the "declining middle". The most familiar and common example in the literature has been to determine if the percentage of wage earners earning less than half the median wage has increased or declined? Has the percentage earning above this level but less than twice the median wage -- i.e. the "middle" -- increased or declined? In short, have the proportions of all workers employed in low, middle, or high wage jobs changed over time? This tripartite division of the wage distribution is a rather simple and literal-minded interpretation of the "declining middle" metaphor but is adequate to make the point here.

The question of which approach to use depends on what issue is being addressed. We are concerned here with where the net increase in jobs over the 1981-86 period is found in the wage distribution, at the bottom, middle or top as defined by wage levels. We are not concerned with whether those jobs that fall in the middle, say 20%, of all jobs were paying higher or lower wages in 1986 than in 1981. The relative wage levels that define the boundaries of the, middle in this latter case changes between years, and hence the definition of the "middle" change in terms of relative wage levels. We could not allow that to occur in our analysis.

Ideally, the best way to compare two wage distributions to determine changes in shape is to convert them to relative wages or earnings (scaling by the mean or deflating using the median or mean), and then to plot them together and inspect the plots. This was done in this project and a sample of the cumulative distributions (the lowest quintile) for both years are shown in Chart 2.

Constructing the Wage Level Boundaries

Almost all studies of changes in employment shares by wage or earnings categories have taken the metaphor of the 'declining middle' literally and divided the labour force into three groups -- a top, middle and a bottom -- thus ignoring the possibility that important changes may be taking place within

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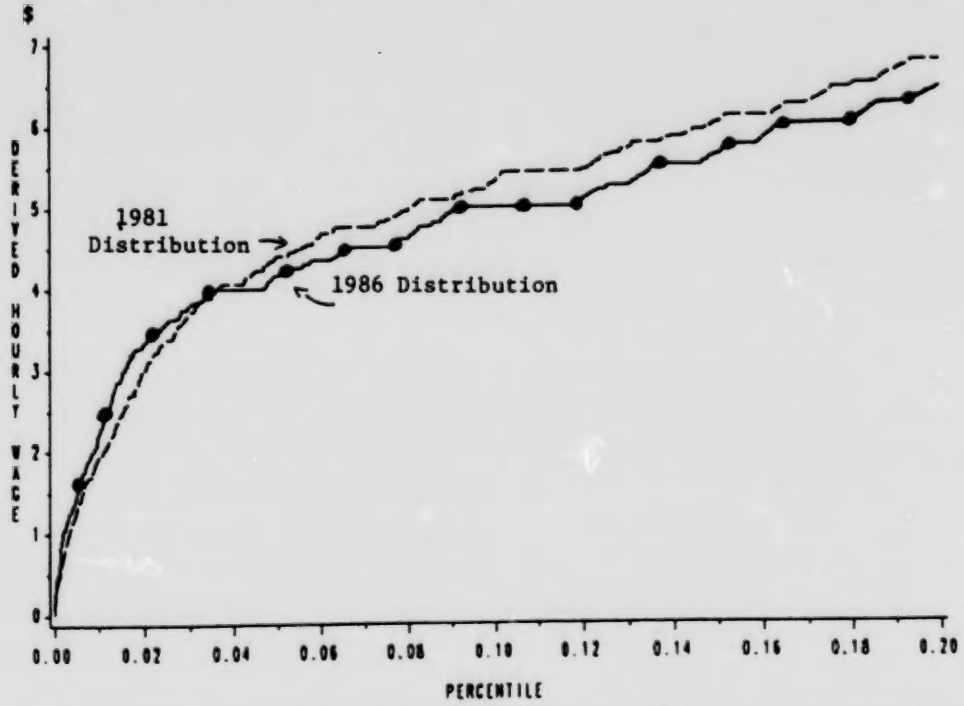
falls (e.g. see Leckie, 1988). Thus, one can get apparently conflicting results with the two approaches. For example, in this study, we show that the share of jobs in the middle two wage levels (out of ten) falls from 20.4% to 18.9%. In contrast, the share of wages going to the middle two deciles (or middle quintile) rose slightly from 18.2% to 18.4%. In fact, however, the two approaches answer different questions.

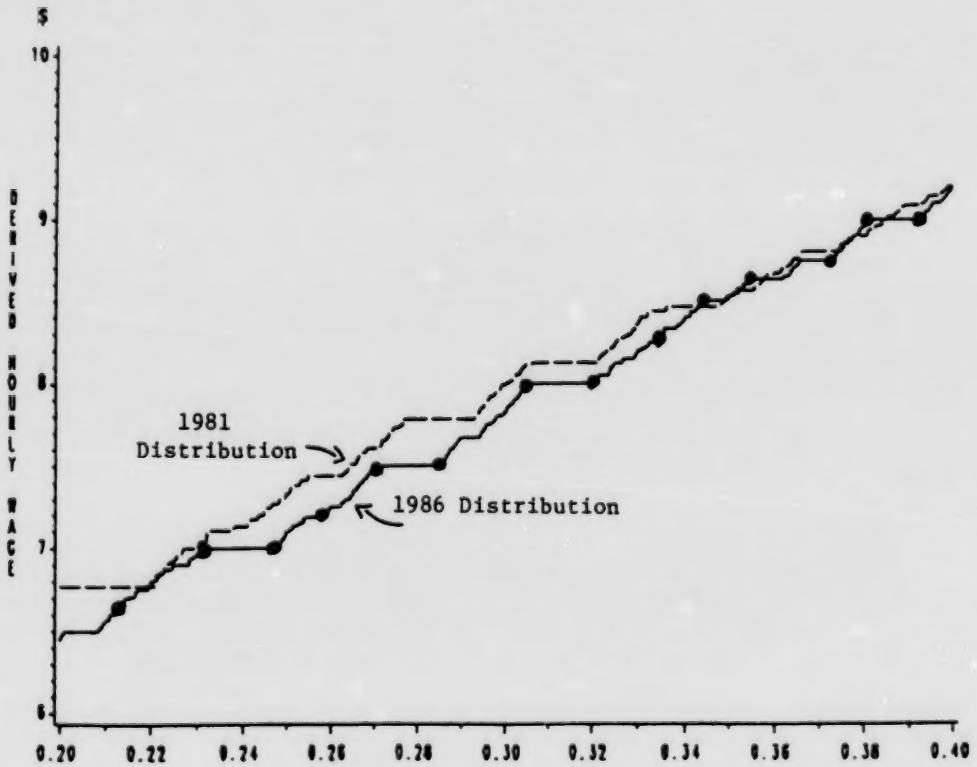
CHART 2. CUMULATIVE 1981 and 1986 WAGE DISTRIBUTION FOR F.T.E. JOBS

FIRST QUINTILE COMPARISION, 1986 DOLLARS *



* 1981 wage data inflated by change in the median wage between 1981 and 1986

SECOND QUINTILE COMPARISION, 1986 DOLLARS



these three broad groups. To address this problem our analysis identifies 10 wage categories. As the results indicate, this turns out to be an important decision since much of the movement over the 1981-86 period was out of the low-middle wage levels (levels 2, 3 and 4) into the bottom of the distribution (level 1).

To construct the boundaries of the wage levels, all FTE jobs in the 1981 distribution are placed in deciles[9] (i.e. the bottom 10% of jobs, the next 10%, etc). The wages in the jobs at the boundaries of the deciles define the wage levels. This provides convenient groupings of jobs in the wage distribution, since they all have approximately the same number of jobs, and among other things, the issue of small samples affecting some wage levels but not others in the more detailed analysis does not arise. The boundaries in 1981 were the hourly wage rates of $3.87, 4.99, 5.89, 6.81, 7.71, 8.77, 9.99, 11.51 and 14.34 (approximately $30,000 annually assuming a 40 hour week).

The hourly wage boundaries are inflated using the change in the median wage between 1981 and 1986 (1.32) as the wage inflator. The wage boundaries than became $5.24 (approximately $11,000 annually), 6.76, 7.97, 9.22, 10.43, 11.87, 13.52, 15.58, and 19.41 (approximately $40,000 annually assuming a 40 hour week) in 1986. This method is equivalent to deflating all 1986 wages using this wage deflator or to comparing relative wages in the two years (i.e. wages relative to the median). It is also conceptually and methodologically identical to using wage categories based on fixed ratios of the median (e.g. calculating the proportion of jobs below, say, half the median). The choice of the deflator is important, and discussed below. All FTE jobs in 1986 are then allocated to the 10 wage levels, and changes in numbers and shares of jobs in each of the 10 wage levels could be computed in the analysis.

The Choice of a Deflator

Selecting a deflator to compare wage distributions is important both conceptually and empirically. Bluestone and Harrison (1985) for example use the consumer price index (CPI) as their deflator in order to examine changes in

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(9) *Exact deciles could not be used because of a problem of "heaping" of jobs around certain wage levels. Hence, the groups contained approximately 10% of all jobs. This does not matter, since the use of deciles is only a convenient way of selecting wage boundaries in the wage distribution.*

the distribution of real wages. As discussed earlier, this solution does not help answer the underlying question - Is the shape of the earnings of wage distribution changing? Their results are substantively important since they index changes in real standards of living but analytically they confound the problem since their findings showing a downward redistribution of earnings could be entirely a result of a decline in average real wages without any changes in the shape of the distribution.

The choice of deflator is empirically important as well. In their re-analysis of Bluestone and Harrison's data, Kosters and Ross (1988) show that by varying many of the assumptions discussed here the same data can produce results that are the opposite of the original Bluestone and Harrison findings. Inspection of the results of Koster and Ross, however, (p. 25) shows that the main difference between the two sets of findings is a result of changing the measure of the CPI used as the deflator. The reason for this is not difficult to understand. Changing the deflator changes the boundaries of the wage categories in the terminal year (here 1986). Hence, with a different deflator, what was a low-paying job near the low-middle boundary may become a middle-paying job. The reason for this is that a change in the deflator changes the point at where the two distributions cross, and hence changes the picture regarding changes in the shape of the distribution.

Because of this, we conducted a sensitivity test using various wage deflators, the change in the median, the change in the mean, and the change in wages at the 52nd percentile (which was affected by the "heaping" issue discussed below). The results on Table 1. indicate that the change in the shape of the distribution is basically the same regardless of which wage deflator is used. The median was selected because it is the most robust, and not as likely to be affected by changes in the tails of the distribution.

The Problem of Wage "Heaping" in the Data

There is a tendency for respondents to report their wages in values which are at dollar or half-dollar values, for example, 5.00, 5.50, 6.00, 6.50, etc. It may be that the actual values of wages tend to be at these values, or it may be that people tend to round to these values. Either way, there is a "heaping" effect which introduces a problem in comparing distributions.

TABLE 1: Sensitivity of the Change in the Wage Distribution to the Choice of an Inflator

- Full-time Jobs -

Wage Level	1981 Wage Distribution	1986 Wage Distribution					
		Boundaries of Wage Categories Inflated Using:					
		(1) Change in Mean Wage		(2) Change in Median Wage		(3)Change in 52nd Percentile	
		1986 Distribution	Change in Share 81-86	1986 Distribution	Change in Share 81-86	1986 Distribution	Change in Share 81-86
1	8.6	10.7	2.1	10.9	2.3	10.7	2.1
2	9.0	8.7	-0.3	9.0	0.0	8.7	-0.3
3	10.4	8.7	-1.7	8.4	-2.0	8.7	-1.7
4	10.2	9.6	-0.6	10.0	-0.2	9.6	-0.6
5	10.3	9.7	-0.6	9.7	-0.6	9.7	-0.6
6	10.4	9.7	-0.7	9.6	-0.8	9.8	-0.6
7	9.2	10.0	0.8	10.7	1.5	9.9	0.7
8	11.3	12.1	0.8	11.2	-0.1	12.1	0.8
9	11.3	12.0	0.7	11.8	0.5	12.0	0.7
10	9.3	8.9	-0.4	8.7	-0.6	8.8	-0.5

To assess the extent of "heaping" the cumulative distribution of all FTE jobs (rank-ordered by wage level and placed in percentiles) vs. hourly wages for 1981 and 1986 was plotted. A sample of the plot for the two lowest quantile is shown in Chart 2. The plateaus in the Chart indicate a large number of FTE jobs at the same wage level (i.e. heaping).

For example, all jobs which fell between the 9th and 12th percentile (i.e. 3% of all FTE jobs) listed their wages as $5.00 in the 1986 data. If 5.00 were selected as the boundary of one of the levels of wages in 1986, then it would be impossible to determine exactly what <u>percent of jobs</u> were between, say, $4.00 and $5.00, (a hypothetical group). Is the $5.00 boundary at the 9th percentile, 12th percentile, or somewhere in between? If the plateaus (i.e. heaping) are significant, as is the case here, it can introduce considerable error in these analysis. To help overcome this, hourly wage boundaries of the wage levels were selected such that none of them fell on a plateau in either the 1981 or 1986 data.

Wages vs. Total Compensation

Over the post-war period, non-wage benefits have increased as a percentage of total compensation, but to date no way has been found to incorporate measures of these benefits into studies of wages and earnings. Most respondents are simply unable to report employer contributions to pension plans and other fringe benefits. As a result, measured trends in wages may not reflect trends in total compensation especially over a period when the share of non-wage benefits in total compensation is increasing. As always, however, the problem is not so much the presence of measurement error but rather the nature and direction of the bias introduced by the error. Since we are concerned with <u>relative</u> rather than <u>real</u> wages, in this study the critical issue is whether fringe benefits as a share of total compensation grew more quickly in the top, middle or the bottom of the wage distribution between 1981 and 1986. If the distribution of non-wage benefits by wage level in 1986 was approximately the same as in 1981, then our results are essentially neutral with respect to this type of error.

The Selection of Time Points for Comparison

As discussed in the introduction, measured changes in the wage distribution can also be sensitive to the time points chosen for the comparison. It is important that periods which are dominated by a contraction or an expansion alone not be used. It is also important to consider what the relative position of the two years in the business cycle can mean for the interpretation of the result. This was discussed in the introduction.

However, selecting points just one year apart, which may be roughly in the same position in the cycle, can also influence the results. For example, had the 1981-86 or 1980-85 period been selected, the results would be somewhat different. It is unlikely, however, that the major conclusions of the study would be altered. Data from the census for 1980-85 indicate a similar pattern of change to that observed from the Labour Market Activity Survey data over the 1981-86 period. This is outlined in Appendix I.

The Decomposition Technique

For purposes of demonstration, the decomposition of the change in the wage distribution into that due to the changing industrial mix and the changing wage distribution within industries is described.

The algebra of the technique is outlined below but the approach is basically quite straightforward. The total change in any level of the wage distribution (say the lowest level, which increased its share by 2.7 percentage points between 1981 and 1986) is decomposed into three factors:

(1) that due to the change in the distribution of full-time equivalent jobs among the eight sectors between 1981 and 1986, holding the wage distribution within sectors constant;

(2) that due to the change in the wage distributions within the eight sectors, holding the distribution of jobs among sectors constant; and

(3) an interaction term, which accounts for the proportion of change due simultaneous change in both the wage distribution within sectors and the distribution of jobs among sectors. This term is usually fairly small compared to (1) and (2).

This method is mechanical, in that some distributions are held constant while others are allowed to change. This of course does not occur in reality. Nonetheless, the technique allows a decomposition of the change in a distribution which is quite instructive.

Let X_{ijt} denote the number of full-time equivalent jobs in industry i, wage level j in year t.

$X_{.jt}$ denote the number of jobs in industry i, wage level j.

$X_{..t}$ denote the total number of FTE jobs in year t.

Then let $W_{ijt} = X_{ijt}/X_{i.t}$ denote the proportion of all jobs in industry i and year t that are in wage level j.

and

$I_{it} = X_{i.t}$ be the proportion of all jobs in year t that are in industry i and

$P_{jt} = X_{.jt}/X_{..t}$ be the proportion of all jobs in year t that are in wage level j.

Let ΔP_j denote the change in the proportion of jobs in wage level j between 1981 and 1986.

Then $\Delta P_j = P_{j86} - P_{j81}$ and note that $\sum_j \Delta P_j = 0$ but $P_{jt} = X_{.jt}/X_{..t}$

which can be expressed as:

$$P_{jt} = \sum_i ((X_{ijt}/X_{i.t})\ (X_{i.t}/X_{..t})) = \sum_i W_{ijt}\ I_{it}$$

Hence $$\Delta P_j = \sum_i W_{ij86}\ I_{i86} - \sum_i W_{ij81}\ I_{i81}$$

but $W_{ij86} = W_{ij81} + \Delta W_{ij}$

Hence $$\Delta P_j = \sum_i (W_{ij81} + \Delta W_{ij})\ (I_{i81} + \Delta I_i) - \sum_i W_{ij81}\ (I_{ij81})$$

Multiplying out and collecting terms gives

$$\Delta P_j = \sum_i W_{ij81}\,\Delta I_i + \sum_i \Delta W_{ij}\, I_{i81} + \sum_i \Delta W_{ij}\,\Delta I_i$$

component due to change in distribution of jobs among industries

component due to change in wage distribution within industries

component due to change in both, or interaction term

The above formula decomposed the change in each individual wage level, of which there are ten. To provide a single measure of the results of the decomposition across all 10 levels, the following approach is used.

All change in shares (e.g., P_j, I_i, W_{ij}, etc.) are incorporated in the measure as absolute values, where the signs are ignored.

Each of the three components' contribution to the total change in share is the weighted average across all wage level of its contribution in each level. The weights are the absolute value of the total change in share in each wage level.

It is calculated as follows: Let $P_{i,j}$ be the change in share due to component i (e.g., job mix among industries) in wage level j. Let ΔP_j be the total change in share in decile j. Then $p_{i.}$, the weighted average across all levels j of the change in share due to component i is:

$$P_{i.} = \sum_{j=1}^{10} \left(\frac{|\Delta P_j|}{\sum_{j=1}^{10} |\Delta P_j|} \quad \frac{|P_{ij}|}{\sum_{i=1}^{3} |P_{ij}|} \right)$$

The first term in the summation is the weight.

THE CHANGING WAGE DISTRIBUTION: TRENDS FOR DEMOGRAPHIC GROUPS

General Trends

> Between 1981 and 1986 the distribution of jobs by hourly wage rate became more concentrated at the very bottom and upper middle levels of the wage distribution. Associated with these changes were a declining share of jobs at the lower middle and middle wage levels and some decline at the very top of the distribution.

Approximately 296,000 full-time equivalent (FTE) jobs[10] were added to the Canadian economy between 1981 and 1986, a net increase of 3.4 percent (Table 2). If jobs had grown at the average rate in all wage levels, the shape of the wage distribution would not have changed. The pattern of change, however, was very uneven. Two points in the distribution stand out: wage level 1, in which the number of jobs grew by 33.5%, and wage level 7, which grew by almost 21%. The growth of all other wage levels but the ninth were either negative or below average.

As a result of this growth pattern, the wage distribution in 1986 was more polarized than in 1981 (Table 3). The largest shift (-2.0 percent) was from the lower middle (level 3) into the bottom of the wage distribution (level 1), which grew from 9.4 percent of jobs to just over 12 percent. The share of jobs in the "middle" of the distribution (wage levels 5 and 6) declined by a total of 1.5% and the share of jobs in the top (levels 7-10) grew from 40.1 percent to 41.2 percent. These changes are displayed in Chart 3 where the 10 wage levels are grouped into five wage classes: low (level 1), lower-middle (levels 2-4), middle (levels 5-6), upper-middle (levels 7-9) and high (level 10).

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(10) *An FTE job is 2,080 hours of labour during a given year, the number of hours worked during a year in a 40 hour per week job. Respondents reported on all jobs held during a year (1981 or 1986). The number of hours worked at each job is known, and in the study every job is converted to some fraction of a full-time equivalent (FTE) job by dividing the hours worked in the job by 2,080. Hence the focus is on the number of <u>hours</u> of work at a given hourly wage rate procured by persons of a given age, sex or education level, and the number of hours of labour provided in each industry or occupation at a given wage rate.*

TABLE 2: Net Change in Full-time Equivalent Jobs by Wage Level, Canada, 1981-1986

Wage Level	Net Change	Growth Rate
1.	275,393	33.5%
2.	9,129	1.1%
3.	-151,281	-16.5%
4.	28,866	3.3%
5.	-21,023	-2.3%
6.	-52,649	-5.9%
7.	163,441	20.9%
8.	16,316	1.7%
9.	67,706	7.0%
10.	-39,981	-4.9%
Total	295,917	3.4%

TABLE 3: Change in the Distribution of F.T.E. Jobs by Wage Level, Canada, 1981-1986

Wage Level	Percentage Distribution 1981	Percentage Distribution 1986	Change in Share
1.	9.4	12.1	2.7
2.	9.4	9.2	-0.2
3.	10.5	8.5	-2.0
4.	10.1	10.1	0.0
5.	10.2	9.6	-0.6
6.	10.2	9.3	-0.9
7.	8.9	10.5	1.6
8.	11.0	10.8	-0.2
9.	11.0	11.4	0.4
10.	9.2	8.5	-0.7

Trends by Age and Sex

> The pattern of change in the wage distribution was dramatically different among age groups and in no age group was the economy-wide pattern replicated. Rather there was a shift in jobs toward the bottom of the wage distribution for young people and an upward shift among workers over 35. The relative wages of young people declined in the period; those of older workers rose.

Chart 3 shows the percentage change in relative mean wages between 1981 and 1986 for ages 16-64.[11] The horizontal reference line at zero denotes no change in relative wages. If wages had grown at the same rate in all age groups they would all fall on the horizontal line. Positive values indicate gains in relative wages (i.e. wages grew faster than the national average) and negative values indicate decline. As the pattern in the chart indicates, relative mean wages of all age groups under 35 declined and for workers under 25 this was by as much as 15-20%. Conversely, relative wages among older workers rose by up to 15% in jobs held by workers age 45-50.

> Although the wage distributions of both sexes were more polarised in 1986, the wage distribution of women shifted mainly toward the bottom and that of men toward the top. This was a result of the concentration of female workers in the younger age groups.

The pattern observed for all jobs -- increased concentration at the bottom and the upper middle levels of the wage distribution -- affected both men and women. However, the largest changes among women were a decline in level 3 (-3.1 percent) and a large increase at wage level 1 (4.5 percent). In contrast, the share of jobs held by men in levels 7-10 increased by 1.9 percentage points compared to a 1.4 point increase at levels 1 and 2. As a result, the median

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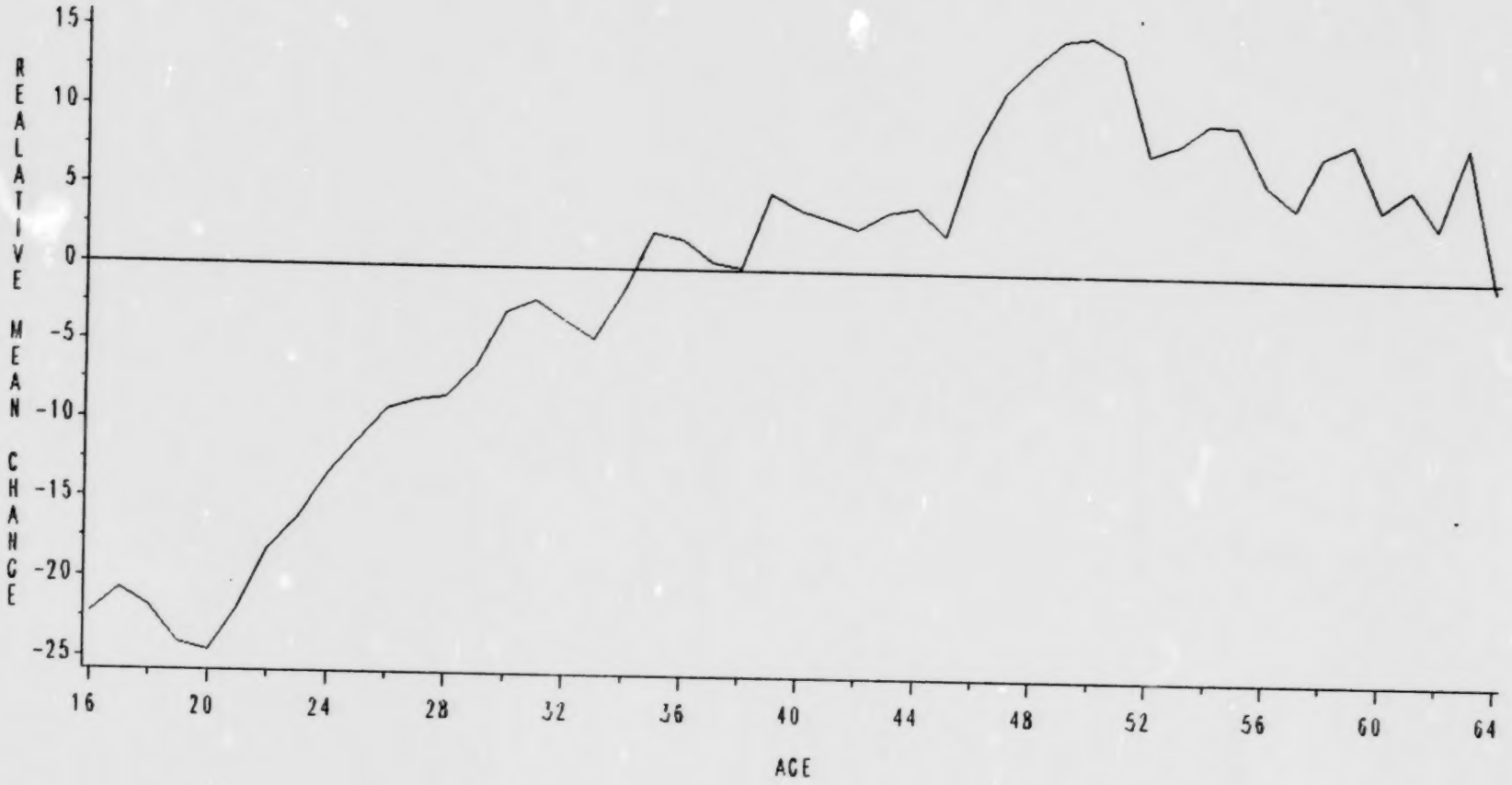
(11) *The relative mean wage (RMi) for age group i is simply the mean wage for age group i divided by the mean wage for all age groups . The percent change in the relative mean wage is simply:*

$$\frac{RM_{i,86} - RM_{i,81}}{RM_{i,81}} \times 100$$

CHART 3

PERCENTAGE CHANGE IN RELATIVE MEAN HOURLY WAGES BY AGE, 1981-86
THREE YEAR MOVING AVERAGE



wage of women as a percentage of the median wage of men fell from 73.9 percent in 1981 to 71.6 percent in 1986. However, this gender difference is largely a result of sex-specific patterns of labour force participation by age. Within all but the oldest age group, patterns of change for men and women were quite similar.

The detailed distributions for both men and women by broad age groups are presented in Table A1 (Appendix). Following are the main highlights from that table.

- o In jobs held by women age 16-24, there was a net shift of almost 20 percent out of wage levels 3 to 10 into the very bottom wage category. By 1986, almost 60 percent of jobs held by young women were in the two lowest wage levels. The downward trend in wages in jobs held by young men was almost as large. There was a net shift of 18 percent out of the higher wage levels into wage levels 1 and 2. These two bottom levels accounted for 44.2 percent of the jobs held by young males in 1986.

- o The wage distributions in jobs held by men and women age 25-34 also declined but less dramatically. The most important change for both sexes was the decline in high wage jobs (levels 9 and 10). The percentage of high paying jobs held by men in this age group declined from 28.7 to 20.6 percent. In jobs held by women, the change was from 13.3 to 9.3 percent.

- o In contrast, there was a large upward shift in the wages paid to men and women 35-49 and to men age 50+. In the 35-49 age group, the percentage of jobs in the upper three wage levels rose from 29.2 to 33.4 percent for women and from 61.5 to 68.2 percent among men. For males age 50+, the share of jobs in the top four levels rose from 49.8 to 62.9 percent. There was little change in the wage distribution of women age 50 and over.

> The downward shift in wages in jobs held by the young affected workers at all levels of educational attainment. In contrast, the upward shift in wages in jobs held by older workers disproportionately benefitted post-secondary graduates.

The distributions by education level in Table A2 show that educational credential were no protection against the downward shift in wages in jobs held

TABLE 4: Change in the Distribution of F.T.E. Jobs by Wage Level and Sex, 1981-86

Wage Level	Female		Male	
	% 1986	Change in Share	% 1986	Change in Share
1.	18.1	4.5	8.1	1.3
2.	12.7	-1.1	6.9	0.1
3.	11.2	-3.1	6.7	-1.5
4.	12.1	-0.1	8.7	-0.1
5.	10.9	-0.3	8.8	-0.8
6.	9.9	-0.7	8.9	-1.1
7.	7.9	0.7	12.2	2.1
8.	7.5	0.8	13.1	-0.6
9.	6.0	-0.1	15.0	1.0
10.	3.8	-0.6	11.6	-0.6

by younger workers. In jobs held by 16-24 year-olds, there was a net shift from higher to lower wage levels of 21% in jobs held by workers with less than secondary school, 22.1% in the group with secondary school completed, and 17.2% in jobs held by post-secondary graduates. In jobs held by people with less than post-secondary education the shift was mainly from the middle into the bottom wage level; in jobs held by post-secondary graduates the shift was from the higher wage levels into the bottom and lower-middle levels.

The downward trend was equally indiscriminate with respect to educational credentials among 25-34 year olds and, if anything, was more severe with the better educated since in this group there were more high paying jobs to lose. There was a net shift out of the top three wage levels of 6.7% in jobs held by people with less than secondary education, 7.6% for those with completed secondary education, and 9.7% in jobs held by post-secondary graduates.

Educational credentials were more useful to older workers. In jobs held by 35-49 year olds, virtually all of the gains were in jobs held by post-secondary graduates. In this group, the share of jobs in the top four wage levels increased by 7.1% and there was little net shift of any sort in jobs held by those with less than a post-secondary degree. For the 50 and over group, there was a net shift into the top four wage levels of 11.9% in jobs held by post-secondary graduates, 3.4% in jobs held by workers who had completed secondary school and 7.3% in jobs held by workers with less education.

These are very large changes in the distribution of wages across age groups in so short a period of time and they continue a trend in the age-earnings profile that has been evident since the seventies (Kennedy, 1987a, 1987b). What they dramatize, however, is just how downwardly "flexible" youth wages have been in Canada over this period. The question is why? We return to this in the conclusion after other age-related trends have been examined.

The Growth of Part-Time Employment

Part-time employment has been rising since the sixties, a trend that has aroused considerable attention and no little concern because of the lower wages and limited access to employer pension plans and other fringe benefits typically associated with part-time employment (Labour Canada, 1983). For example, the mean hourly wage of part-time work in the 1986 Labour Market Activity Survey was $8.64 compared to $11.71 for full-time work. Moreover, part-time

work is particularly characteristic of both women and younger workers. In 1986, women supplied 73 percent or almost three-quarters of the part-time hours and more than a third (36 percent) of part-time hours were accounted for by workers under 25. Most part-time employment is in the service industries. Indeed, just three of a set of 51 industries accounted for half of all part-time hours in 1986: retail trade (25%), health and welfare (17%) and food services (14%). However, as Levesque (1987) has shown, the shift to part-time employment has been a generic one across the whole economy, observed in virtually all industries. Changes in industrial structure accounted for less than one-fifth of the increase in part-time work between 1975 and 1986. The recession of 1981-83 accelerated the growth of part-time employment. Between 1973 and 1979, full-time work grew by an annual average of 3.3 percent and part-time work by 4.0 percent. In the 1979-83 period part-time growth accelerated to 6.1 percent on an annual average basis and there was no change in full-time employment (Krahn and Lowe, 1988: 54; Kaliski 1985). As the economy recovered after 1983, the rate of growth in part-time work slowed considerably (Levesque, 1987). Nevertheless, for the 1981-86 period as a whole, part-time hours worked -- defined as jobs in which hours worked were less than 30 per week -- had a much higher growth rate (18.9 percent) than full-time employment (2.3 percent). The growth of part-time jobs in wage level 1 (53 percent) was especially high (Table A3).

Part-time employment grew in all industries during the recession and average wages in part-time jobs are lower than average wages in full-time jobs. Nevertheless, a very small share of the change in the overall wage distribution can be attributed to the growth in part-time employment. For example, less than 8 percent of the growth in low paying jobs among young worker can be attributed to an increase in part-time work.

These changes raise the question of how much of the downward shift in wage levels -- and youth wages in particular -- is a result of the shift to part-time employment. The answer is not very much. The reason for this is that while part-time <u>employees</u> represent a large and growing share of the Canadian labour force, the lion's share of <u>working hours</u> -- the units being analysed here -- is provided by full-time workers. In 1981, the share of working time contributed by part-time workers was 6.4%. And despite the high growth of part-time employment, the share of part-time employment in full-time equivalent

jobs had risen by less then a percentage point (to 7.3 percent) in 1986.[12] As a result, the distributions and patterns of change for full-time workers tend to reproduce the patterns and trends found for the whole economy almost exactly (See Chart 4 and compare Tables A3 with Table 3). The change in share at wage level 1, for example was 2.7% for all jobs and 2.3% in full-time jobs.

For young workers, the conclusions are similar (compare Tables A4 with Table A1). Among all young workers, the share of jobs paid at the lowest wage levels (1 and 2) grew from 32 percent to 51 percent, or about 19 percentage points. In the full-time jobs held by young workers, the share at levels 1 and 2 grew by approximately 17 percentage points to almost 47 percent of all jobs. In sum, the more rapid growth of part-time employment during this period does not "explain" the trends observed in the wage distribution for the economy as a whole and contributed little to the downward trend in youth wages.[13]

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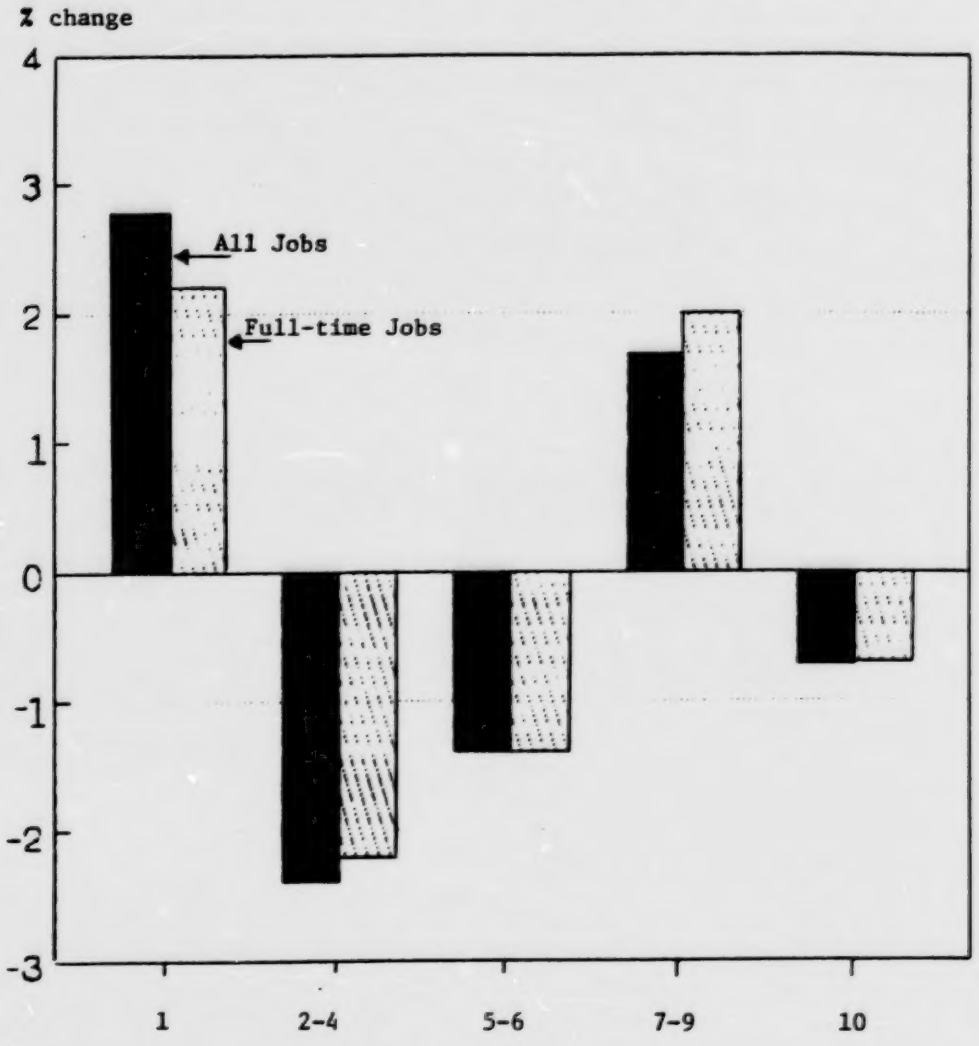
(12) *This is not to deny the importance of part-time employment but it's growth will mainly affect earnings rather than wages within jobs.*

(13) *It is possible to be more precise on this matter. Application of decomposition techniques described later in the paper show that the increase in part-time employment, on average, accounted for only about 10 percent of the change in the wage distribution of younger workers. In levels 1 and 2, increased part-time employment accounted for less than 8 percent of the change.*

CHART 4

CHANGE IN SHARES OF JOBS, BY WAGE LEVEL, 1981-86



THE IMPACT OF INDUSTRIAL RESTRUCTURING ON THE WAGE DISTRIBUTION

In the previous sections, overall patterns of changes in the wage distribution between 1981 and 1986 have been observed; growth at the very bottom and the upper levels of the wage distribution and decline in the lower middle and middle; a downward shift in the distribution among the young and an upward shift among older workers, and other patterns. Industrial restructuring of jobs - in particular movement away from the goods production to services - is often presented as one of the main driving forces behind such changes in the wage distribution. The argument linking industrial restructuring of employment to changes in the wage distribution go something like the following.

Rapid increases in employment in the consumer services (retail trade, food and accommodation, etc.), which has relatively low-paying jobs, is seen as increasing the bottom end of the wage distribution. It is also argued that employment growth in the business services and public sector services produces higher paying jobs and affects the upper end of the wage distribution. The decline in the manufacturing and natural resource sectors compounds this effect, it is argued, by deleting the ranks of middle-paying jobs. These changes are brought about by changing technology and rising productivity in goods production, combined with changing domestic demand for goods and services (eg. see Picot and Lavalle). The 1981-82 recession is seen as accentuating these long-term trends in the restructuring of jobs, as goods-producing companies in particular cope with changes in the pattern of demand for goods and services, introduce new technologies to remain competitive, and alter hiring practices to keep costs down. Such structural changes, it is hypothesized, significantly influenced the wage distribution in Canada. As mentioned in the introduction, various papers have addressed this theme.

Very little analysis of the Canadian situation has been done, as most papers refer to the American economy.

This section will determine:

(1) the growth in jobs in various industries during the 1981-86 period, and whether these jobs were low or high paying;

(2) how much of a redistribution of jobs among major industrial sectors actually occurred during the 1981-86 period;

(3) to what degree this restructuring was responsible for the changes in economy-wide wage distributions that have been observed;

(4) to what extent there were changes in the wage distributions within the major industrial sectors.

The Growth in Low and High-Paying Jobs

All three major goods-producing sectors had fewer jobs in 1986 than in 1981, while all major service sectors (except public administration) experienced growth in the 6% to 15% range. Employment in public administration fell over the period.

The overall drop in goods-producing[14] jobs is reflected in the following numbers: the natural-resource based sector had 131,000 fewer full-time equivalent jobs in 1986 than in 1981, representing a 16% drop. Manufacturing (excluding natural-resource based) had 92,000 or 6% fewer jobs, and construction had 26,000 or 5% fewer full-time jobs[15] (Table 5).

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(14) *An eight sector breakdown, which is described in Appendix Table A-5, is employed in the analysis in this section. Agriculture has been excluded from all analyses in this paper. The non-agricultural goods-producing sector includes the natural-resource based, other manufacturing and construction industries. All other industries are considered service.*

(15) *It is worth remembering, however, that the pattern of growth (or decline) in jobs over the period was not a smooth, continuous one, and that as the recovery continued beyond 1986 this pattern may change. The goods-producing sector lost ground to the services sector mainly because of the depth of the loss during 1982 and 1983, not because of slower growth during the 1983-86 recovery. The goods-producing industries had substantial declines during the 1982 and 1983, followed by a recovery. The recovery growth did not bring them back to pre-recession levels by 1986, although recovery continued in 1987 in construction and the natural-resource based industries in particular. (see Chart 6, which shows growth in paid employment is measured by the Labour Force Survey. This shows slightly different trends than Table 5 since different data are sources (LFS and Labour Market Activity Survey), as are different employment concepts (paid employment and the number of F.T.E. jobs)). In the commercial (business services, consumer services, distribution services, the for-profit sector) services growth stopped during the recession, but there was not a large decline as in the goods area. Employment in health/education/welfare grew at a fairly constant rate over the period; growth in government employment was very low. The health, education and*

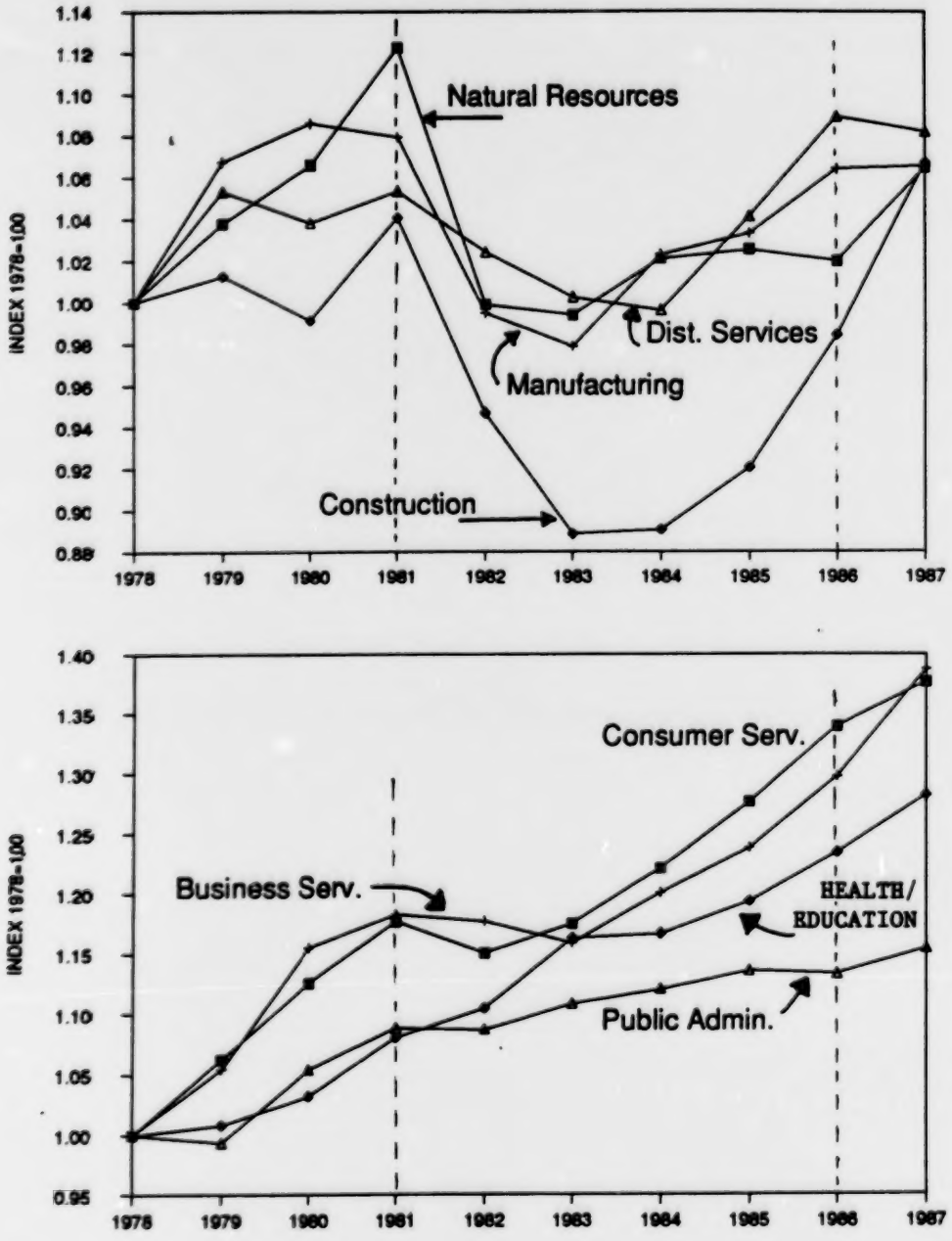
TABLE 5: Net Change in the Number of F.T.E. Jobs, by Industry Sector and Wage Level, 1981-86

Wage Level	Nat. Resource Based	Other Manufacturing	Construction	Distributive Services	Consumer Services	Business Services	Health/ Educ./ Welfare	Public Admin.
1.	..	11.8	..	..	252.4	-8.6	17.5	..
2.	-7.2	-10.2	8.9	..	13.4	..	13.4	..
3.	-25.9	-39.4	6.1	..	-53.8	..	-24.9	-9.7
4.	-9.7	-31.8	..	..	20.5	25.7	27.6	..
5.	-13.0	-18.9	..	-16.7	-14.1	14.5	40.9	-15.8
6.	-23.7	-17.5	6.7	-17.4	-6.3	..	10.1	6.0
7.	..	30.1	13.0	47.0	17.7	19.3	28.6	11.4
8.	-13.8	-20.7	-14.1	20.9	-5.9	..	46.7	7.6
9.	-9.6	-8.3	-6.3	19.5	..	13.6	42.7	11.1
10.	-24.9	12.7	-31.9	11.0	-19.9	18.3	..	-8.3
Total	-131.5	-92.1	-25.9	68.2	208.8	71.2	206.2	-9.0

welfare sector registered the highest overall growth during the period not because of particularly rapid job growth (2.9% per year over the period) but mainly because it did not experience the recessionary setback in job creation of the commercial sector.

CHART 5

Index of Growth in Paid Employment by Industry, 1978-87



Source: Labour Force Survey

In services, the story was the opposite. Employment increased in all industries except government (public administration) over the period. The growth rates were:

- consumer services: 208,000 or 12% growth in full-time equivalent jobs
- health, education and welfare services: 206,000 or 15% growth
- business services: 71,000 or 8% growth
- distributive services: 68,000 or 6% growth
- public administration (govt): -9,000 or 1% decline

We now determine whether the employment growth (and decline) were in low or high paying jobs.

Job gains in the services sector were concentrated in the very lowest wage level and in the upper wage levels (seven to nine). But in the goods-producing sector job losses were fairly evenly distributed across all wage levels and were not concentrated in the middle paying jobs.

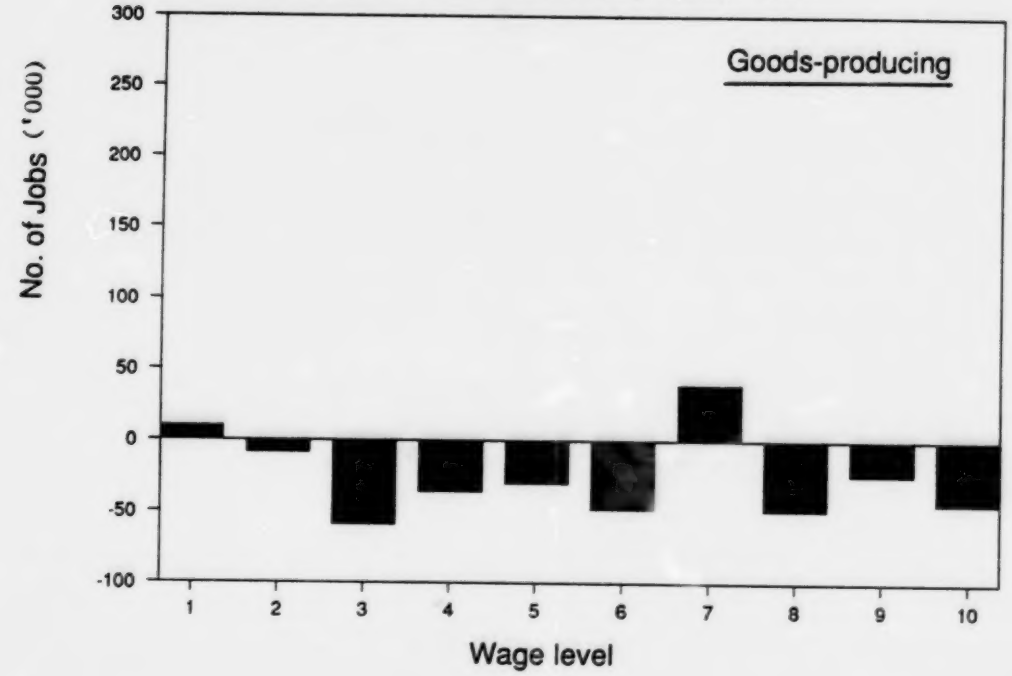
The goods-producing sector had a net loss of almost 250,000 full-time equivalent jobs (an 8% decline) while the services sector expanded by almost 550,000 (a 9% growth) (Table A-6). The net job loss in the goods-producing sector affected almost all levels of the wage distribution; it was not only middle-level jobs which were lost (see Chart 6).

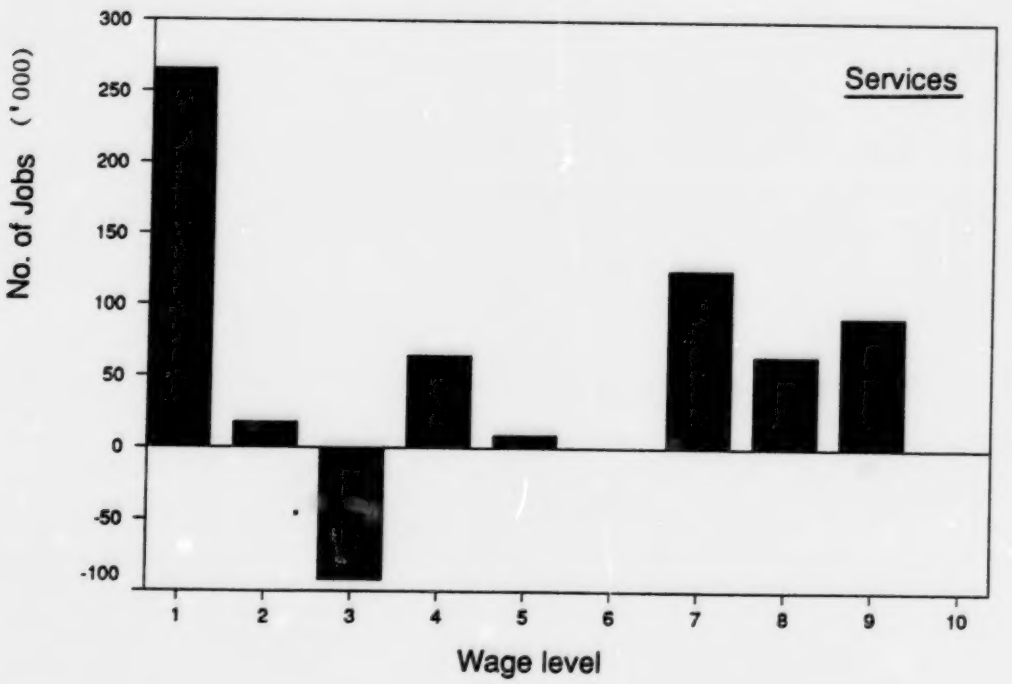
In services, there was a net increase of 260,000 jobs in the very lowest wage level, accounting for about half of the net gain in jobs in that sector. But there was also a gain of 280,000 jobs in wage levels seven to nine (Table A-6). Thus, there were two pockets of job growth in the services in the wage distribution.

In goods production, the construction sector lost high-paying jobs, manufacturing (excluding natural-resource based manufacturing) lost low to middle paying jobs, and job losses in the natural-resource based sector were distributed fairly evenly among all wage levels (except the very lowest).

CHART 6

Net Change in the Number of F.T.E. Jobs, by Wage Level, Goods-producing and Services Sectors, 1981-86





These patterns are evident in Table 5.

> In the services sector, the net gain in jobs in the very lowest wage level was contributed almost exclusively by the consumer services.(16)
>
> The higher paying jobs came mainly from the health/education/welfare sector and the distributive services.(17)

The net gain over the 1981-86 period in very low paying jobs in the consumer services sector (250,000 jobs) occurred largely in the retail trade and food and accommodation (Appendix Table A-7) industries. These two sections accounted for 43% and 40% of the gain in low paying jobs respectively. Health, education and welfare contributed the highest number of better paying jobs - a 118,000 net gain in wage levels 7 to 9. Distributive services also contributed significantly to net gains in the higher paying jobs, as almost 90,000 were created in the 7th to 9th levels.

The business services sector (consulting and advertising firms, financial, insurance and real estate firms), while contributing a net growth of 71,000 jobs over the period, had these jobs fairly evenly distributed over the fourth to tenth wage levels. In sum, the increase in jobs in this sector - at least during this period - was not concentrated among higher paying jobs.(18)

To sum up, the net job growth in the services sector was highly polarized, with substantial growth at the very bottom and in the upper-middle of the wage distribution. This is in keeping with what earlier writings would have led us to expect. Job losses in the goods-producing sector were not, however, concentrated in middle wage jobs as has often been argued, but were distributed

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(16) *The consumer services includes retail trade, amusement and recreational, personal, food and accommodation and miscellaneous.*

(17) *Distribution services include transportation, storage, communications and wholesale trade.*

(18) *It should be noted that the relative importance of each sector in contributing (or losing) high or low-paid jobs may be somewhat unique to each period of time. For example, the relatively high contribution of the health/education sector reverses somewhat the trends of the 1970s (see Picot, 1986). As mentioned earlier, this is not so much due to any extraordinary growth in the sector, as to the fact that it was not affected by the recession.*

across the entire wage distribution. These findings refer, of course, to a particular period. In future studies, we will extend this analysis back to the 1970s to determine if the same patterns are observed.

But the job losses and gains outlined for the 1981-86 period can stem from two processes: a change in the mix of jobs among sectors, or a change in the wage distribution within a sector. For example, it is usually assumed that the rapid growth in low-paying jobs resulted from very rapid employment growth (as compared to others) in the generally lows-paying consumer services industries. However, if middle paying jobs in that sector were replaced by low-paying jobs because of a downward shift in the wage distribution, this too would also show up a growth in low paying jobs. This would not require employment growth in the sector overall. The next section determines the extent to which each of these processes were evident during the period.

The Changing Industrial Mix of Jobs

The service sector grew by almost 4 percentage points between 1981 and 1986. This was about as much change during five years as occurred during the entire decade of the 1960's, and during the 1970's. Consumer services and the health/education/welfare sector increased their employment shares the most.

The extent of the redistribution of jobs is shown in Table 6. The share of F.T.E. jobs in goods production fell by almost 4 percentage points, a very substantial change in just five years. It is difficult to assess to what extent this stems from cyclical causes, and will be reversed as the recovery continues, and to what extent the charges and structural and relatively permanent.[19] There was, however, by 1986 three to four years of recovery since the trough in the 1981-82 recession. Data on the experienced labour force indicates there was a 3.9 percentage point drop in the non-agricultural goods-producing sector's share of the labour force observed during the decade

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(19) *The share of paid employment (part-time and full-time) in the good-producing industries as reported by the Labour Force Survey fell 3.0 percentage points between 1981 and 1986, and 2.9 points between 1981 and 1987. Hence, the continued recovery, particularly in construction and the natural resource industries, has had very little effect on the overall pattern by 1987.*

TABLE 6: Percent Distribution of Full-time Equivalent Jobs by Major Sector, 1981-86

	1981	1986	Change in Share
Natural-Resource Based	9.6%	7.8%	-1.8%
Manufacturing (excl. resources)	18.8	17.1	-1.6
Construction	5.5	5.0	-0.5
Sub-total: Goods-producing	33.9	30.0	-3.9
Distributive Services	12.4	12.7	0.3
Consumer Services	19.7	21.3	1.7
Business Services	9.7	10.2	0.5
Sub-total: Commercial serv.	41.8	44.2	2.4
Health/Education/Welfare	15.2	16.9	1.8
Public Admin.	9.2	8.8	-0.4
Sub-total: Non-commercial serv.	24.4	25.7	1.3
All Services	66.1	70.0	3.9

of the 1960s, and greater than the 3.2 percentage point during the decade of the 1970s (Picot, 1986). While not exactly comparable, the 4 percentage point decline in the goods-production share of full-time equivalent jobs indicates a redistribution in the same order of magnitude as during the 60s and 70s, only over five years.

The equivalent expansion in the service sectors' share was concentrated in the consumer services, which expanded its share of jobs by 1.7 percentage points, and the health/education/welfare sector (a 1.8 percentage point increase). The share of jobs in public administration declined.

The Wage Distributions in the Industrial Sectors

By historical standards, the industrial restructuring of jobs during this period was substantial, and might have contributed significantly to the changes observed in the economy-wide wage distribution. But for this to occur, the wage distributions in the different sectors must be dissimilar. If they are similar, the industrial redistribution of employment, no matter how great, will have little effect on the overall wage distribution.

Information on wage distributions has been hard to come by in the past. The available data (mainly from the Survey of Employment, Earnings and Hours) has referred to "average weekly earnings" in industries. While useful, they do not provide any information on the distribution (rather than average) of wages. They are also affected by changes over time in weekly hours of work, and the mix of full-time and part-time employees. Distributions have been available only for average annual earnings of individuals (from the Census and the Survey of Consumer Finances), which are quite different from the distribution of hourly wages paid in jobs (see Appendix I for more on this). Hence, these 1981 and 1986 data are the first available in Canada on distributions of hourly wages in full-time equivalent jobs by industry.

There is, not surprisingly, substantial difference in the wage distribution among industries. The natural-resource based industries and the public services (health/education/welfare and public administration) are the highest paying areas; consumer service industries are the lowest paying.

The 1986 wage distributions and the changes in the wage distributions for the eight industrial sectors between 1981 and 1986 are provided in Appendix Table A-8. Wage data on more detailed 52 industries are shown in Table A-5. Following are some observations from the data.

- In the natural-resource based industries, one of the high-paying sectors, fully 54% of full-time jobs are in the top three wage levels, compared to approximately 30% for the economy as a whole (Charts 7 and 8). The corresponding figures for the other high-paying sectors, health/education and the public administration, are 38% and 45% respectively.

- The distributive services and construction sectors are also relatively high paying with the peak of the distribution in the 7th and 8th wage levels. Manufacturing (other than natural-resources based) offers jobs fairly evenly spread across all parts of the wage distribution.

- The lowest paying sector is consumer services; one-third of all full-time jobs are in the very bottom level (compared to 12% for the economy as a whole), and over one-half are in the bottom two wage levels. The median wage in this sector is $6.75 per hour, compared to $10.41 for the economy as a whole.

But an industry's wage distribution does not necessarily maintain the same shape over time. Change in the wage distribution within industries can also occur and the effect of such changes can be as large or larger than changes than result from the shift of jobs between industries.

> There was significant change in the wage distributions within many sectors over the 1981-86 period, and the change was not uniform. There was an upward shift in the wage distribution in the natural-resource based and distributive services sectors, and a considerable downward shift in wage levels in construction and the consumer services.

The proportion of the jobs in the upper part of the wage distribution (levels 7 to 9) in the natural-resource sector rose by 5.2 percentage points; the lower levels (2 to 6) saw their share fall by 4.7 points. This shift may

Chart 7 Percent of F.T.E. Jobs in the Top Three Wage Levels, by Industrial Sector, 1986

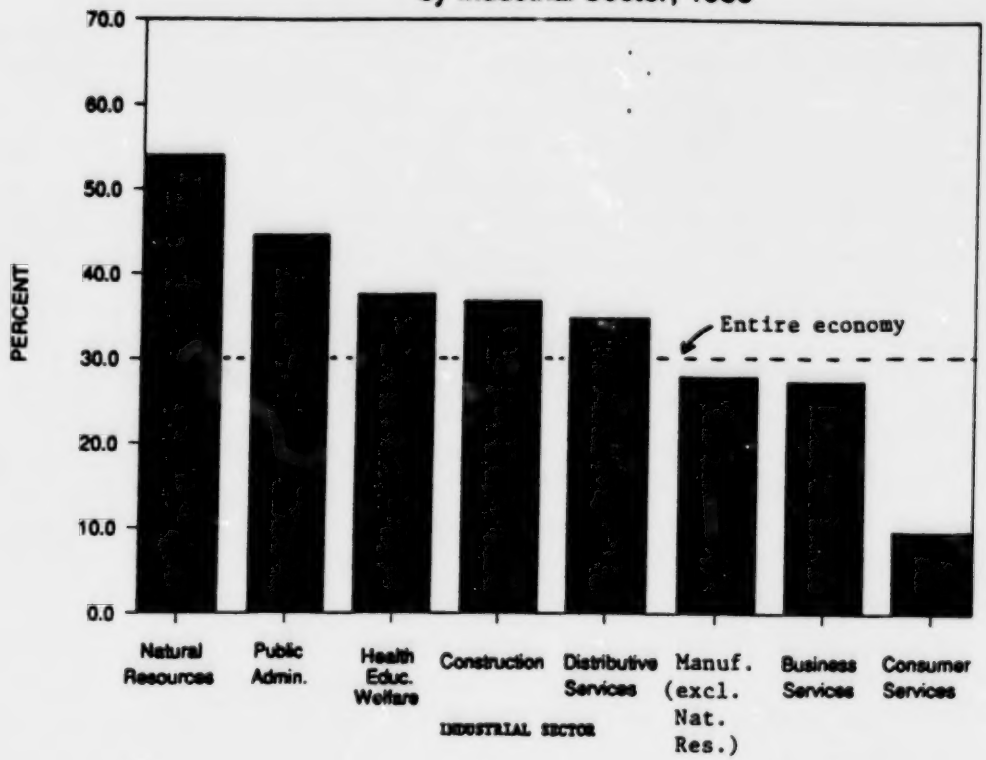
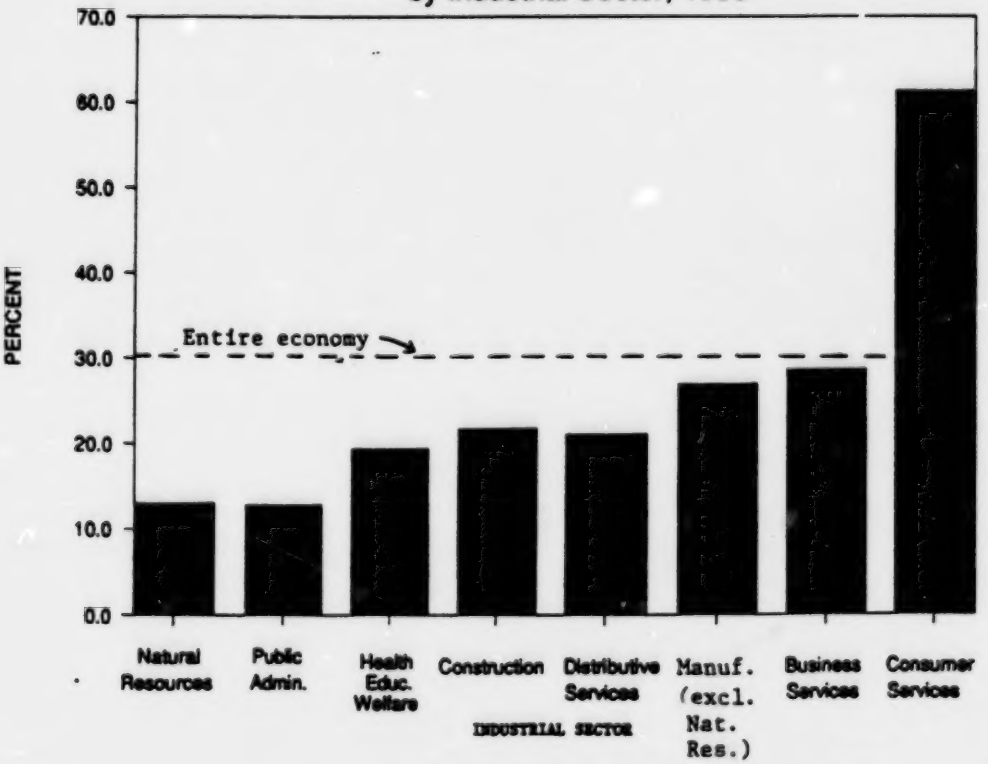


Chart 8 Percent of F.T.E. Jobs in the Bottom Three Wage Levels, by Industrial Sector, 1986



have resulted from a number of factors. Technological change and productivity increases in many of these industries may have resulted in the shedding of less skilled and lower paid labour. And during the recession, there is a tendency to let the less skilled labour go at a more rapid rate than the more highly skilled and highly paid, since the employer has often invested more in the latter group with regard to training and recruitment. Since there was little or no hiring in this sector over the period, the work force would have aged and their level of pay increased. This is all speculation and it is difficult to know without further analysis the major causes of this shift in the wage distribution. There was a similar upward shift in the distributive services, where the proportion of jobs in the four upper wage levels increased by 5.9 percentage points (Table A-8).

The downward shift in the wage distribution in the already low-paying consumer services sector was very large. The proportion of F.T.E. jobs in the very bottom wage level increased from 22% to 33%. An increase in part-time jobs is partly responsible for the shift, but the same general pattern is observed for full-time employment. Another possible explanation could be the hiring of large numbers of young people, who earn less than older workers. But the downward shift is observed among the young as well. This topic is addressed more fully in the conclusion.

Decomposing the Change in the Wage Distribution

We have seen that there has been a shift in employment into lower paying industries (especially consumer services) and shifts in the wage distributions within industries, particularly a downward shift in the wages paid in the consumer services. of relative wages across the economy as a whole. In this section, we assess the relative importance of each in contributing to the overall change in the distribution of wages. A decomposition (or standardization) technique is used to answer this question.

The algebra of the technique is outlined in the methodology section, but the approach is basically quite straightforward. The total change in any level of the wage distribution (say the lowest level, which increased its share by 2.7 percentage points between 1981 and 1986) is decomposed into three factors:

(1) that due to the change in the distribution of full-time equivalent jobs

among the eight sectors between 1981 and 1986, holding the wage distribution within sectors constant;

(2) that due to the change in the wage distributions within the eight sectors, holding the distribution of jobs among sectors constant; and

(3) an interaction term, which accounts for the proportion of change due simultaneous change in both the wage distribution within sectors and the distribution of jobs among sectors. This term is usually fairly small compared to (1) and (2).

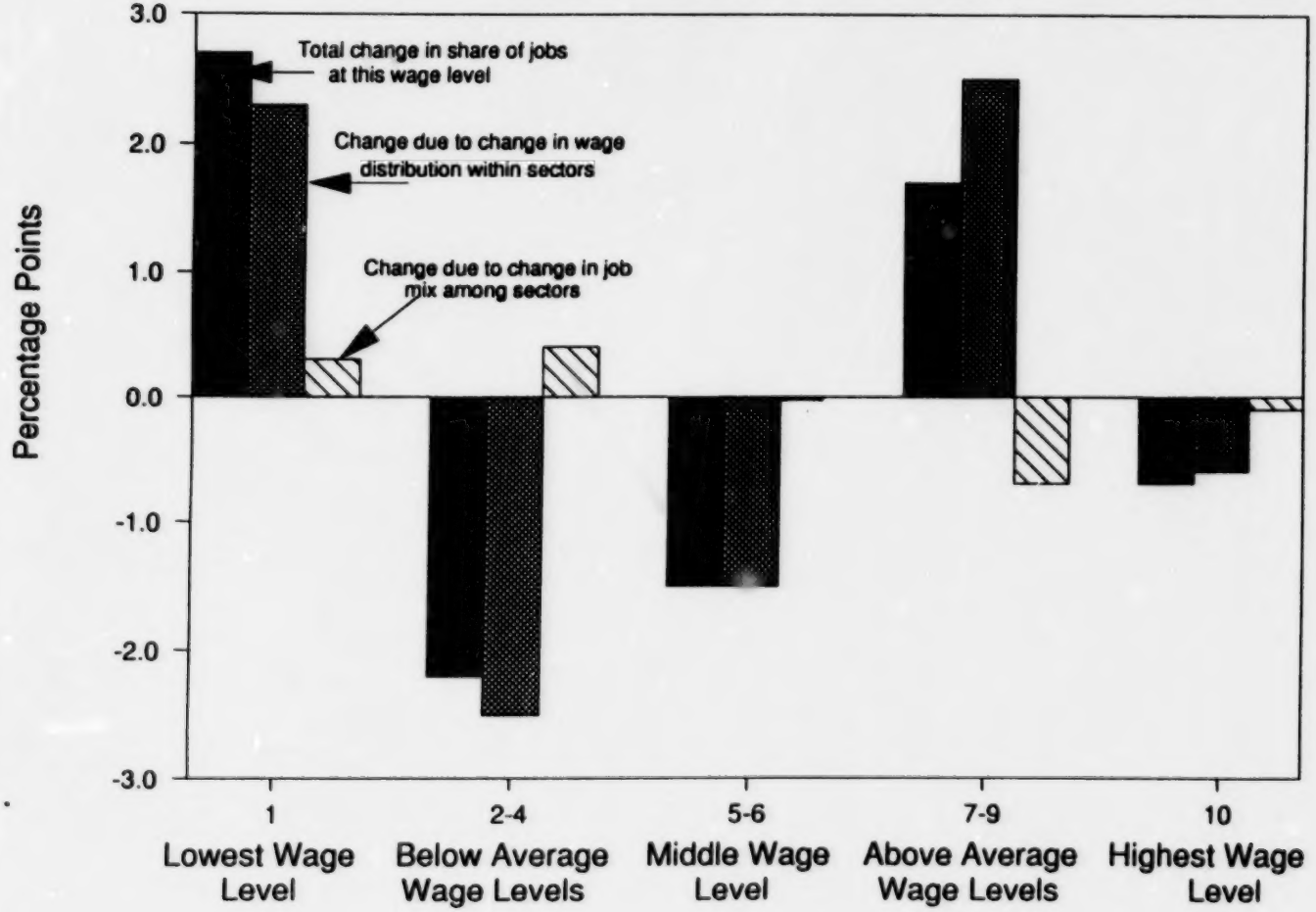
This method is very similar to commonly used standardization approaches, where one distribution is changed from its initial year values (here 1981) to final year values (1986) while all other factors are held constant. Factor (1) above basically answers the question: if the 1986 distribution of jobs among sectors had existed in 1981 and all other factors had remained constant, how much change would that have introduced in the economy-wide wage distribution? A similar interpretation of factor (2) can be made. The results of the decomposition follow.

> Even though there was a very dramatic restructuring of jobs among industrial sectors by historical standards, this movement accounted for only a small part of the overall change in the economy-wide wage distribution. The majority of this change was accounted for by shifts in the wage distribution within sectors.

The results of the decomposition are reported in Chart 9 and Table A-10, they are exemplified by the pattern of change at the very bottom of the distribution. The share of jobs in wage level one increased by 2.7 percentage points but of this, only 0.3 points was a result changes in industrial mix. Fully 2.3 points of this increase was due to the downward shift in wage structures within industrial sectors. This pattern holds for other large changes as well. Changes in the wage distribution within industrial sectors largely explains the increase of higher paying jobs in levels 7 to 9. Overall, approximately 13% of the change in the wage distribution was accounted for by a

CHART 9

Industry-based Decomposition of Change In the Wage Distribution, 1981-86



restructuring of jobs among industries, and 84% by changes in the wage distribution within sectors.(20)

Thus, at the level of the economy as a whole, and for this particular period, the shift in jobs away from the goods-producing sector forward services explains only a very modest amount of the increase in the share of jobs at the very bottom and in the above average paying jobs. This may have been caused by a changing occupational structure within industries, or changes in the wage distribution within occupation themselves. This issue is addressed in the next section.

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(20) *It might be argued that these are very broad industry groupings, and if a larger number of industries were used in the analysis the industry mix factor would account for more change. The same decomposition was done using twenty-seven industries and 10 wage levels, and the results were very similar. Fourteen percent of the change was accounted for by the changing industrial mix of jobs; 82% by changes in the wage distribution within sectors.*

THE CHANGING OCCUPATIONAL MIX AS IT AFFECTS THE WAGE DISTRIBUTION

Jobs can be described not only in terms of industry, but also in terms of occupation. And just as there has been an on-going industrial transformation which can influence the wage distribution, so too the occupational composition of jobs is changing. These events are, of course, related.

To some extent the effect of the changing industrial structure on wages really manifests itself through changes in the occupational structure. Some sectors have a disproportionate share of jobs in predominantly low-paying occupations, others in high-paying occupations. But other factors besides industrial restructuring can affect the occupational distribution and, hence, the wage distribution. Technological changes within industries, changes in management practices and changes in the relative price for various kinds (or ages) of labour can influence the occupational mix of the labour employed.(21) These changes in the occupational mix can in turn influence the economy-wide wage distribution. We assess the extent to which this occurred over the study period.

Analysts have often attempted to determine if the growth in jobs has been in the high or low segment of the wage distribution indirectly by using data on changes in the distribution of occupations. The usual approach is to classify occupations as either high, middle or low paying - based on some measure of earnings - and then examine employment growth in the different occupational groupings (eg. see Rosenthal, 1985). If growth in high-paying occupations was greater than that in the low-paying, it is assumed that high paying jobs have increased at a faster rate than low paying jobs.

This approach can be quite misleading since it assumes that the wage distribution <u>within</u> occupations remains constant over time. There is a further implicit assumption that all jobs in occupations with high average earnings are high paying jobs. Neither of these assumptions necessarily holds over any period of time. Generally, high paying occupations, such as the managerial/-

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(21) *Indeed, the same essential change may appear as an industrial shift, an occupational shift, or both. For example, manufacturing firms can increase their use of lawyers or accountants by contracting out to consulting firms in the business services sector, or by hiring more such professionals within the firm.*

administrative where employment growth has been quite rapid recently, contain a substantial number of low paying jobs. Furthermore, wage distributions within occupations change.

Reviewing earlier work on the declining middle thesis in the United States, McMahon and Tschetter (1986) found a declining proportion of employment in lower-paying occupations using the occupational method and an increasing proportion of workers with low earnings when measuring earnings of workers directly. The data came from the same source and referred to the same period. The work based on occupational data alone ignored the fact that earnings (or wage) distributions within occupations had shifted downward in the U.S. over this period (1973-85). It is essential that both changes in the number of jobs in different occupation (i.e. the restructuring of jobs by occupation) and changes in the wage distribution within occupations be considered.

Here, the link between the changing occupational structure and the wage distribution is studied at a very broad level, using ten occupational classifications described in Appendix Table A-12.

The Growth of Low and High Wage Jobs in Occupations

Job growth was highest in the management/administrative category (290,000) followed by professional/technical (150,000), the service occupations (167,000) and sales jobs (125,000). Job loss was concentrated in the largely blue collar processing/fabricating/machining group (loss of 200,000) and clerical occupations (loss of 154,000).

There was substantial variation in the growth rate of F.T.E. jobs over the 1981-86 period, ranging from 30% in the managerial/administrative category to minus 13% among processing of fabricating/machining jobs (Table 7). The combined very high net growth in management/administrative and professional/-technical occupations (440,000)is a key indicator sometimes used to conclude that the pattern of employment growth has generally been positive (i.e. toward the high paying jobs) over this period. But did these occupations contribute only high-paying jobs over this period, and which occupations contributed to the growth in low-paying jobs?

TABLE 7. GROWTH IN FULL-TIME EQUIVALENT JOBS BY OCCUPATION, 1981-86

OCCUPATION	F.T.E. JOBS		NET CHANGE IN F.T.E. JOBS	GROWTH RATE	PERCENT DISTRIBUTION		CHANGE IN SHARE
	1981	1986			1981	1986	
MANAGERIAL/ADMINISTRATION	974.0	1266.9	292.8	30.0	11.1	14.0	2.9
PROFESSIONAL/TECHNICAL	1424.2	1574.4	150.2	10.6	16.3	17.4	1.1
CLERICAL	1694.9	1541.1	-153.8	-9.2	19.3	17.0	-2.3
SALES	589.1	714.6	125.4	21.3	6.7	7.9	1.2
SERVICES	887.8	1054.9	167.2	18.8	10.1	11.6	1.5
PRIMARY OCCUPATIONS	209.3	266.7	57.4	27.4	2.4	2.9	0.6
PROCESS./FABRIC./ MACHINING	1549.3	1354.1	-195.2	-12.6	17.7	14.9	-2.7
CONSTRUCTION	560.4	497.5	-62.9	-11.0	6.4	5.5	-0.9
TRANSPORTATION EQUIP. OPERATORS/OTHERS	797.5	775.0	-22.5	-2.8	9.1	8.6	-0.5
UNCLASSIFIED	76.9	14.3	-62.6	-81.4	0.9	0.2	-0.7

The net job growth in the very lowest wage jobs were predominantly in the sales and service occupations. The fall in below average and middle paying jobs stemmed largely from job losses in clerical and processing/fabricating occupations. The gain in above average paying jobs (wage levels seven to nine) were contributed mainly by the professional/technical, managerial/administrative and primary related occupations. The rapid job growth in the managerial/administrative category was not confined to high paying jobs, however, and was distributed over a very wide range of the wage distribution, from below-average paying to the highest paying jobs.

There was a rapid increase in very low-paying sales and service jobs (63,000 and 124,000 jobs respectively (Table 8), which was disproportionately large even for these occupations. The proportion of jobs in the bottom wage level rose 7.7 percentage points in service occupations, and 5.8 in sales. Overall, the net new jobs created in these groups were not as high paying as those that existed in 1981.

The decline in clerical and processing/fabricating/machining jobs resulted primarily in fewer below-average paying and medium level paying jobs, as these groups together lost 163,000 below average paying (levels 2 to 4) and 114,000 medium (levels 5 and 6) jobs. However, the job loss in processing/fabricating was also felt in above average and the highest paying job categories, as 40,000 of these jobs were lost in each of these wage categories (Table 8).

The strong growth in the managerial/administrative group affected almost all wage levels, not just those at the top. It contributed significantly to job creation in below-average paying jobs (adding 63,000), medium paying (39,000), above-average (141,000) and the highest jobs (74,000). This demonstrates the variety in the kinds of jobs created in this category.

Chart 10 shows the overall pattern of job gains and losses for three broad occupational groupings. More detail on net change in jobs in different wage levels is provided in Appendix Table A-13.

TABLE 8: Major Occupational Contributions to Change in F.T.E. Jobs by Wage Level

Lowest-Paying Jobs (bottom-wage level)

Service	124 thousand F.T.E. jobs
Sales	63
Clerical	34
Total net change in jobs	275

Below-Average Paying (wage levels 2 to 4)

Managerial/Admin.	63
Clerical	-94
Processing/Fabricating	-69
Total net change in jobs	-113

Medium Level Jobs (wage levels 5,6)

Managerial Admin.	39
Clerical	-51
Processing/Fabricating	-63
Total net change in jobs	-74

Above Average Paying Jobs (wage levels 7,8,9)

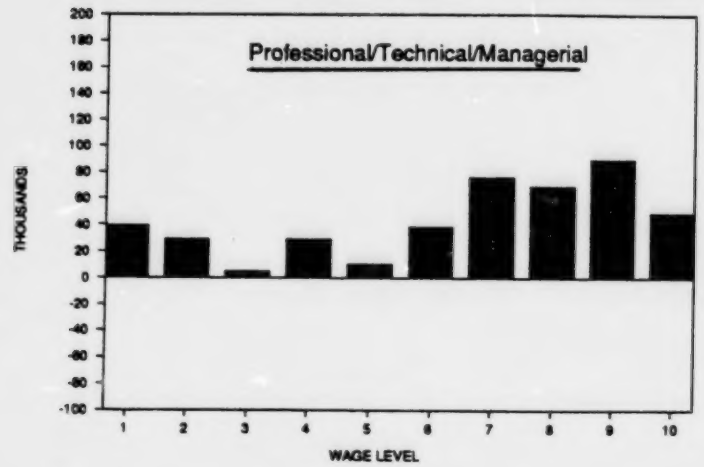
Professional/Tech.	141
Managerial/Admin.	95
Primary-related Occns.	46
Processing/Fabricating	-40
Total net change in jobs	248

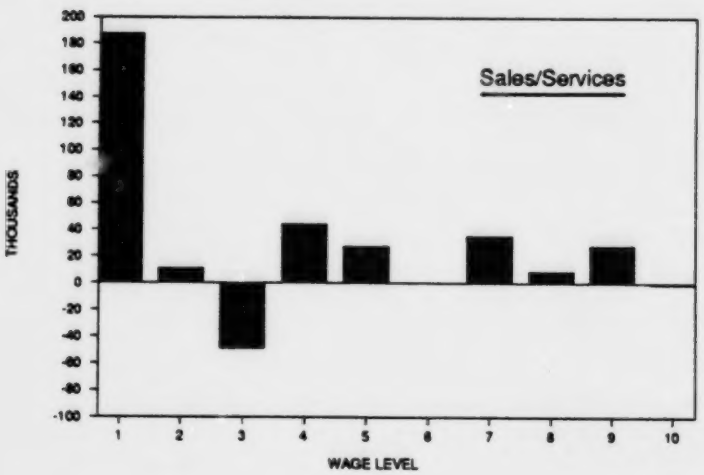
Highest Paying Jobs (10th wage level)

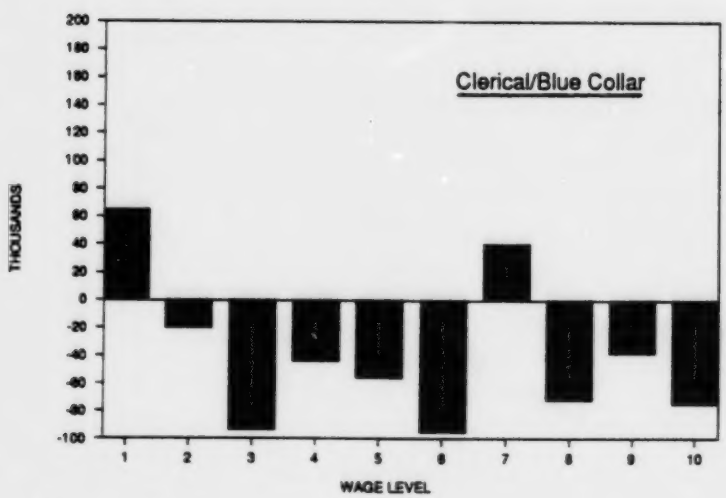
Managerial Admin.	74
Processing/Fabricating Machining	-40
Construction	-29
Professional/Tech.	-24
Total net change in jobs	-40

CHART 10

NET NEW JOBS IN OCCUPATIONS, BY WAGE LEVEL, 1986







The Two Components of Change in the Wage Distribution

The strong job growth in managerial/administration, sales and service groups resulted in increases in their share of jobs by 2.9%, 1.2% and 1.5% respectively. The share of jobs in blue collar areas declined (by 2.7 percentage points in processing/fabricating, 0.9 percent in construction).

Such restructuring will, of course, have some effect on the wage distribution. But it is necessary to know something of the wages paid within each group before speculating as to what type of effect any restructuring will have.

> Jobs in the managerial/administrative and highly qualified occupational groups are, overall, the highest paying, followed by jobs in primary occupations and construction. The lowest paying groups are sales and service jobs. However, there is considerable variation in the wage distribution in all these groups.

About one-half of the F.T.E. jobs in managerial/administrative and professional/technical occupations are in the top three wage levels, compared to 30.7 percent for the economy as a whole. There are nonetheless low-paying jobs even in these occupational groupings (with about 15% to 17% in the bottom three levels. Although not always thought of in those terms, primary sector occupations and construction jobs are also relatively high paying, with about one-half of the jobs in these groups located in wage levels seven to nine (Appendix Table A-14).

Sales and services occupational groups are in general the lowest paying, with almost one-half of the full-time jobs in services and 37% of sales jobs in the bottom two wage levels. But again, there are a significant number of high-paying sales jobs (20% in top three wage levels).

There has, then, been a restructuring of jobs between 1981 and 1986 both towards the higher paying groups (managerial/administrative) and the lower paying groups (sales and service) over the 1981-86 period. The movement was predominantly away from the above average paying processing-fabricating-machining and construction occupational groups. Thus, the effect of redistribution will be mixed; increasing jobs at both the bottom and top end of

the wage distribution. But there is a second component of change in the overall wage distribution, the changing wage levels within occupational groups.

> There was a noticeable downward shift in the wage distribution in five occupational groups: sales, service, clerical, processing/fabricating/machining, and construction.

There was substantial change in the wage distribution within the occupational groups between 1981 and 1986, and it was predominantly down in the occupations mentioned above (Table A-14). Thus, simply looking at the growth in historically high paying (or low paying) occupations can be quite misleading as an indicator of whether the economy is producing high or low wage jobs. But the error introduced by using job growth in occupations as an indicator of wage trends is a matter of degree. If over any given period most of the change in wage patterns is a result of changing occupational mix, then the error may be small and even trivial. If, however, most of the change in patterns occurs within occupations, the implications of the error that results can be quite profound. To determine the extent to which broad changes in occupation mix provide us with an accurate gauge of wage trends for the 1981-86 period, the decomposition technique described in the previous section is applied.[22]

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(22) *In the section on industrial restructuring, changes in the wage distribution were decomposed into three factors; (1) changes in the industrial mix of jobs, (2) changes in the wage distributions within industrial sectors, (3) an interaction term. Here, the same three factors are used, except occupation replaces industry. It is the same total change in the overall wage distribution that is decomposed in both cases. The change in the economy-wide wage distribution is, in a sense, viewed once as having stemmed from industry-related changes, once from occupation-related changes. But both capture similar change, since both are characteristics associated with the same jobs in the economy. A decomposition which captures both industry and occupational changes in the same decomposition is conducted later.*

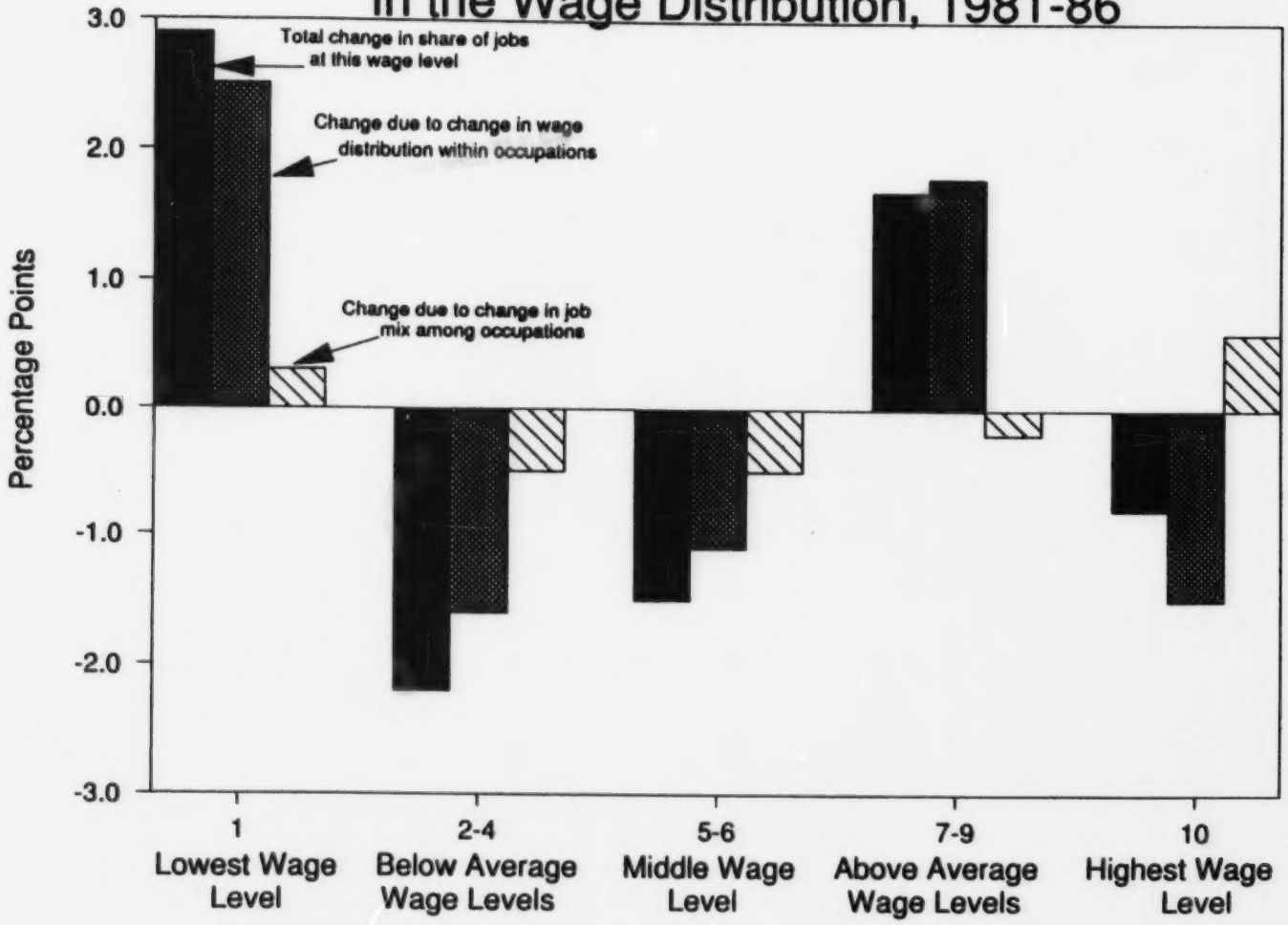
Although the change in the mix of jobs among occupations was considerable, its impact on the economy-wide wage distribution was accentuated and overwhelmed by the change in the wage distribution within these major occupational groups. As with the industry decomposition, the latter factor was predominant.

The decomposition technique described earlier was used to reach this conclusion, which is exemplified by the following data. At the bottom wage level, 2.5 points of the 2.9 percentage point increase in that level's share of jobs was due to a downward shift in wage distribution within occupations (Chart 11 and Appendix Table A-15). This may more reasonably be described as a disproportionate increase in low-paying jobs within the occupational groupings, since it has been seen that all occupational groups contain some low and high paying jobs.

Overall, 19% of the change in the wage distribution was related to the changing mix of jobs among occupations, and 77% to the changing wage distribution within occupations. It is interesting to note that in the very highest paying wage level the structural change in occupations (mainly towards managerial/administrative) was such as to increase the share in this level of the wage distribution. But change in wage distributions within almost all occupational groups were negative for this top level, resulting in an overall loss in share of jobs which are the very highest paying.

CHART 11

Occupation-based Decomposition of Change In the Wage Distribution, 1981-86



These are very broad occupational groups, and one might suspect that the results would differ if more occupational categories were used. However, even when 27 occupational categories are used, the results are much the same.(23)

Occupational Change Within Industrial Sectors

Although the structural change in occupations (economy-wide) accounted for only 17% of the change in the wage distribution, this was larger than the 13% accounted for by the structural change in jobs among industries. This may be for the reasons described earlier - that economy-wide occupational change is a mixture of industrial restructuring as it affects occupations, and changing occupational distributions within industries due to technological change, changing production processes, the relative price of various types of labour, and so on.

Hence, the changing wage distribution within industries which was seen to be so predominant earlier may be in part due to a changing occupational mix within industries and a changing wage distribution within occupations in each industry. Thus, part of what was labelled earlier is a changing wage distribution within industries could be in fact change in the types of jobs (ie. occupations) in the industry. To see if this was true, the total change in the wage structure was decomposed into three factors:

(1) change in industrial mix of jobs, holding other factors constant

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(23) *This analysis has employed the standard type of occupational categories used in such analysis. However, there are two ways in which the categories selected can affect the analysis. First, categories may have occupations within them which are very dissimilar in their wage levels, making it difficult to define low or high wage jobs by broad occupational title alone. Second, with very broad categories, there may be substantial occupational redistribution of jobs within a given broad category. This would show up as a change in the wage distribution within occupation, although it is due to a change in the mix of employment among occupations. To determine if these factors may be influencing the results, 50 occupations were selected (the maximum the recoded 1981 data would allow) and rank-ordered by wage level. These were then grouped into 27 occupational groupings of approximately similar size (the maximum number that could be used in the analysis given the sample size). Using these more homogeneous (w.r.t. wages) and larger number of categories, the decomposition was repeated. The results were very similar: 15% of the overall change in the wage distribution was due to changing mix of jobs among the 27 categories, 72% due to changing wage distribution within the occupational groups, and 12% due to the interaction term.*

(2) change in occupational mix of jobs within industries, holding other factors constant
(3) change in the wage distribution within occupations by industry, holding other factors constant
(4) an interaction term representing the similtaneous change in any two or three factors

The 8 industry groupings, 10 occupational groupings and 10 quasi-deciles used earlier were employed in this analysis.

The results indicate that changes in the wage distribution within occupational groupings still dominate. Overall, of the total change in the wage distribution economy-wide, 22% was due to the joint effect of changes in the industrial mix of jobs, and changes in the occupational mix within industries; 75% was due to changes in the wage distribution within occupations (within industries).

YOUTH: THE EFFECT OF INDUSTRIAL AND OCCUPATIONAL RESTRUCTURING ON THEIR WAGES

Besides the general interest in the labour market experience of youth during the recession and post-recession period as discussed in the introduction, there are two very specific reasons for paying special attention to the effects of restructuring on the wages of younger workers in this study. The first is to establish whether changes in the kinds of industries and occupations in which young people work is the reason for the dramatic downward shift in the wage distribution among younger workers observed earlier. The second reason is that if industrial or occupational restructuring is playing a predominant role in the evolving shape of the wage distribution (which we may have somehow missed in the earlier analysis), the results are more likely to show up among young workers than in the labour force as a whole. The redistribution of jobs probably occurs largely through the relative decline of entry level jobs in some industries and occupations and a relative abundance of entry level jobs in others. Also, redistribution resulting from lay-offs and rehiring is also likely to be concentrated among the young, where rates of permanent lay-off are higher (see Picot and Wannell, 1986). There will be, of course, some redistribution of older workers through job displacement and rehiring, but this is not likely to be as great as the movement among the young. The data for 1981-86 suggest this is the case.

The Industrial and Occupational Restructuring of Jobs for Youth

> As speculated, the adjustment to changing demands for labour in different occupations and industries is concentrated among young people. The restructuring of full-time jobs - both among industries and occupations - was much greater among young than older workers.

The data used in this section refer to full-time jobs only. There has been a rise in part-time employment among students and other young people in recent years (see Table A-4). The implications of this trend have already been examined. Here we turn our attention to the redistribution of full-time job opportunities for young people.

To determine if the redistribution of jobs was concentrated among the young, we turn to the index of dissimilarity[24], which is a measure of the amount of change between distributions of jobs between 1981 and 1986. The higher the value, the more change which has taken place in the distribution. And the values are much higher among 16-24 year olds than other age groups. The index values for changes in the industrial distribution in different age groups are: 16-24: 11.5, 25-34: 4.9, 35-49: 4.8, and 50+: 4.0 (see Table A-16); for the occupational[25] distribution, the values are 16-24: 11.6, 25-34: 5.3, 35-49: 7.3, and 50+, 6.7 (Table A-17).

The occupations and industries which presented expanding jobs opportunities for young people over the period were the same for both men and women, and were predominantly low-paying. The occupational groups and industrial sectors which were contracting as a source of jobs for the young were quite different for the two sexes, however.

Among young males, there was a major industrial shift from the higher paying natural-resource based and average paying manufacturing sector (which together lost a 11.5 percentage point share of jobs) to the low paying consumer services sector (gaining a 10.3 point share, going from one-quarter to one-third of all full-time jobs for young males) (Table A-16). This was a major shift in entry level jobs from the goods-producing to the consumer services for young males, at least during that particular period.

Changes in the occupational structure of entry or near entry level jobs reflected the industrial change. For young men, the share of jobs in the higher paying processing/fabricating/machining declined by 6.9 percentage points (from 29.3% in 1981 to 22.4% in 1986), and the share in the low-paying

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(24) *The index of dissimiliarity, which is employed largely in demography, is defined as follows. Let P_{81j} be the proportion of jobs in wage level j in 1981. Then the index of dissimiliarity between 1981 and 1986 is simply*

$$\frac{1}{2} \sum_{j=1}^{10} \left| P_{86j} - P_{81j} \right|$$

(25) *Comparison of the index of dissimilarity between industry and occupational distributions are not valid, since the number of categories affects the value.*

sales and services occupations combined increased by 8.2 percentage points, from 15.4% to 23.6% (Table A-17).

For young women, as among men, job opportunities were more numerous in 1986 in the consumer services sector, which gained an 8.6% share of full-time jobs (from 31.2% to 39.7%), and in the low-paying sales and services occupations (gaining 7.3 percentage points over the five years). The industries which had lower shares of jobs for young women were evenly distributed, including manufacturing (-2.9% share of jobs), business services (-2.8) and public administration (-2.6). The loss of occupational job opportunities was concentrated, however, in clerical jobs. This may be related to technological change, as there has been much speculation about the effect of micro-computers on this occupational group.

Overall, the restructuring of full-time entry level or near entry level jobs among the young was very large, and among the older populations significant. Given the variation in the level of wages paid among industries and occupations, and the movement towards the lower paying areas, we would expect these changes to have a downward influence on the overall wage distribution for the young. But what of changes in the hourly wage distribution within sectors and occupations.

Changing Wage Distributions Within Industries and Occupations

There was a substantial downward shift in the wage distribution of full-time jobs among 16-24 year olds in every industrial sector and occupational group in the economy, including the high paying areas. Among 25-34 year olds, there was movement out of the highest paying towards middle paying jobs in virtually every industrial sector and many occupations as well. These phenomena were widespread and dramatic.

Of all full-time jobs in the consumer services sector held by 16-24 year olds, the proportion in the lowest wage level (under $5.25) rose by a remarkable 20 percentage points. One-third of the full-time jobs in that sector were in the lowest-wage level in 1981, rising to over one-half in 1986. But this phenomenon was not restricted to that sector, it was very widespread. The

proportion of full-time jobs in the bottom two wage levels rose in every industry.[26] (Table A-18)

And this pervasive pattern was evident in all occupational groups as well (Table A-19). Even in the highly paid occupations, the types of jobs available to young people seem to have changed considerably. The proportion of jobs in the bottom wage level rose 9.5% in the professional/technical occupations, 5.1% in managerial/administration, and a remarkable 22.5% in sales and 17.1% in service occupations.

In many of these broad occupational groups, much of the downward shift in the wage distribution may be caused by different types of jobs being made available to young people even though these jobs are labelled as being in the same occupational group. But it was not only the youth that experienced changes in the wage distribution within industries and occupations.

We noted earlier that among 25-34 year-olds the movement was mainly out of the top of the distribution into middle level jobs. The proportion of jobs among the age group in the top two wage levels (over $15.58 in 1986) fell in every industrial sector, but notably by 15.2 points in construction, 6.8 in business services, and 10.5 in both of the high paying public services sector, health/education and public administration (Table A-20). A similar pattern for 25-34 year olds was observed in virtually all occupational groups, but most noticeable in the high paying managerial and professional/technical occupations, (a 9.3 and 10.4 percentage point decline in share of jobs in the top two wage levels) (Table A-21). As among the very young, the downward movement in the wage distribution among 25-34 year olds was very widespread.

Returning to the young, the decomposition technique described earlier is applied twice - once to industry data and once to occupational data - to assess

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(26) *The proportion of full-time jobs in the bottom two levels (under $6.75) rose 13 percentage points in the natural-resource based sector, 16 points in manufacturing, 15 points in construction, 13 points in distributive services, 24 points in consumer services, 8 points in business services, 14 points in health/education/welfare, and 15 points in public administration. These are tremendously large shifts in the wage distribution over a very short period. One might speculate that a change in the age structure within the 16-24 age group population could contribute to this, as 16 year olds typically earn much less than 24 year olds. However, the proportion of the 16-24 group over age 20 actually rose over this period, which would tend to make the wage distribution of the age group as a whole rise, not fall.*

the impact of industrial and occupational restructuring on the wage distribution.

A Decomposition of Change in the Wage Distribution Among the Young

> While there was substantial redistribution of job opportunities for the young towards the low-paying consumer services sector and sales and service occupations which tended to bring overall wages down, this effect was compounded and overwhelmed by the widespread downward shift in the wage distribution in full-time jobs within industries and occupations. The downward shift in the wage distribution among young people was due primarily to this latter factor.

The overall pattern of change in the wage distribution among the young was mainly a result of the general downward trend across the entire economy. In the industrial-based decomposition, of the 13.5 percentage point increase in the share of full-time jobs in the bottom wage level among 16-24 year olds, 2.0 points was due to a change in the mix of jobs among industries and 10.5 points due to the downward shift in wage distributions within industries (Chart 12a). Overall, 18% of the change in the wage distribution was due to the former factor, 7.8% due to the latter (Appendix Table A-26).

When occupational shifts were hypothesized to be largely explaining the wage changes among the young, and an occupational-based decomposition was conducted, the results were much the same. Of the total change in the wage distribution (ie., the downward shift among 16-24 year olds in full-time jobs), 15% was due to the changing occupation structure, 78% to changes in the wage distribution within occupational groups, and 7% to an interaction term (Table A-27). In the lowest wage level, of the 13.7 percentage point increase in this level's share of jobs, 11.6 points was due to a downward shift in wage distributions within occupational groups (Chart 12b).

For the other age groups, the results were very much the same. The shifts in the wage distribution among the middle aged and older population (over 35) were due predominantly due to upward shifts in wage distribution within (chart fourteen (a)) industries or occupations, accounting for 72% to 87% of the change (Tables A-26 and A-27).

CHART 12A

Industry-based Decomposition of Change in the Wage Distribution, 16-24 Age Group, 1981-86

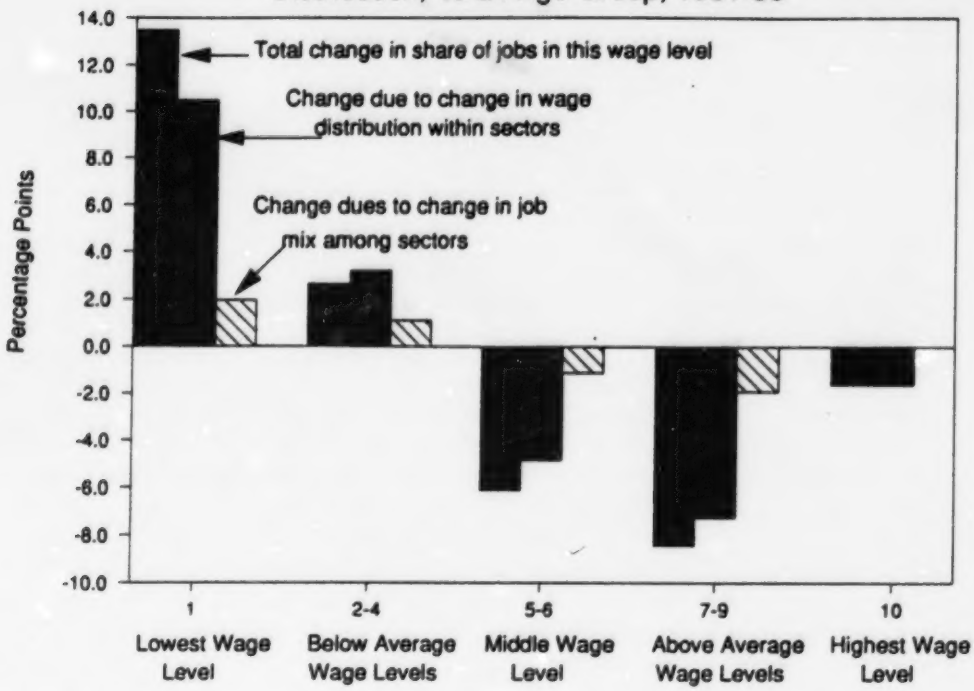
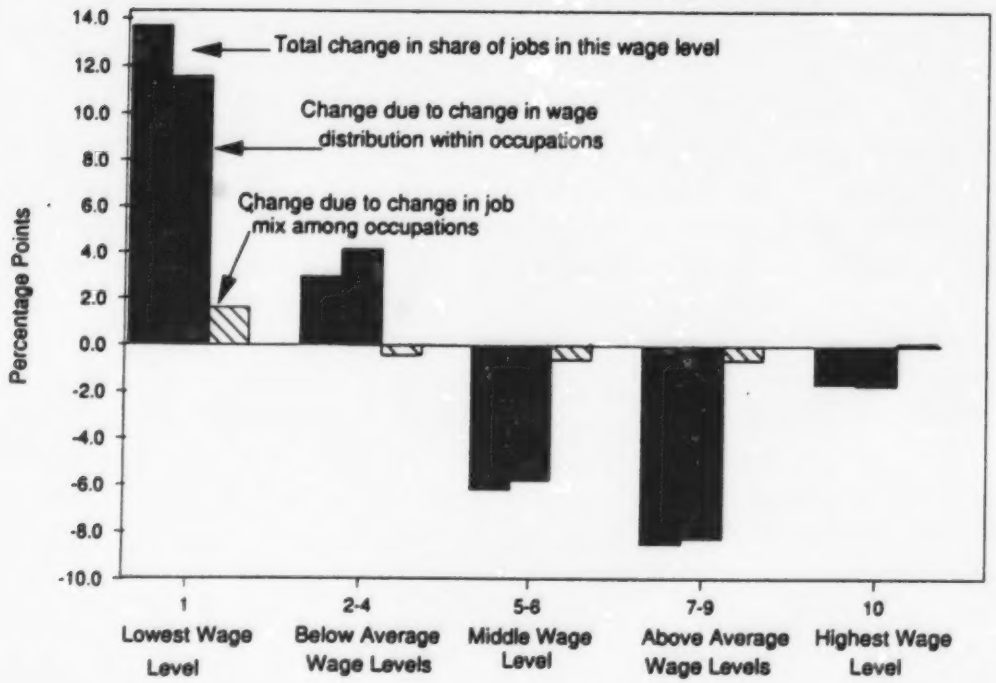


CHART 12B

Occupational-based Decomposition of Change in the Wage Distribution, 16-24 Age Group, 1981-86



> While changes in the wage distribution within occupations was the predominant factor in influencing the economy-wide wage distribution for older age groups as well as among the young, the direction of these changes was quite different. In virtually the same occupational or industrial group, one observed downward shifts in the wage distribution among persons under 35, and upward shifts in the wage distribution among persons over 35.

The increasing concentration of jobs among youth in the bottom of the wage distribution was documented for virtually all industries and occupations, as was the movement of jobs out of the top of the wage distribution into the middle for 25-34 year olds.

But an upward shift in the wage distribution among workers over 50 was observed in many occupations and industries including managerial/administrative occupations (proportion of jobs in the top two wage levels increased 7.1 percentage points), highly qualified occupations (7.4 percentage points), the sales occupation (increase of 7.4 points) and in construction jobs, (7.6 percentage points) (Table A-24 and A-25). Very similar but less marked upward redistribution of wages within occupational groups is evident for the 35-49 age group (Table A-21). And upward shifts are observed for these two older age groups in many industrial sectors, including manufacturing, distributive services, business services and public administration.

There are, obviously, markedly different patterns of wage growth (or decline) between younger and older workers in the same occupation and industries. Why is this occurring? Much of the answer is no doubt related to the drop in demand for entry level jobs (among young people) as a result of the recession and its aftermath, and to the historically large number of young people entering the labour force during the 1980's, although the number was actually declining throughout the period. This question is addressed more fully in the conclusion of the paper.

REGIONAL PATTERNS

An Analysis of Five Regions

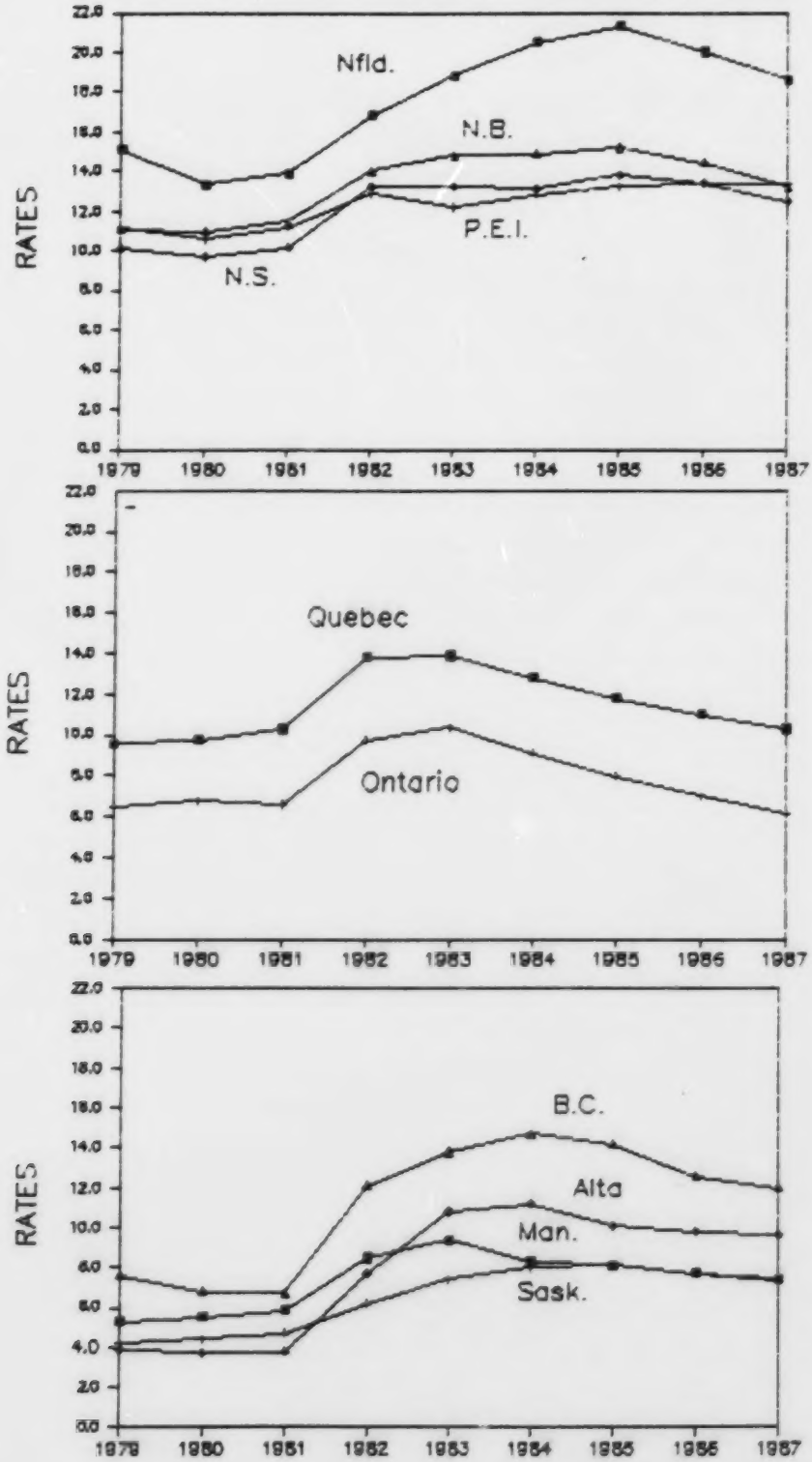
The evidence we have examined so far is for Canada as a whole. Because Canada's population is so heavily concentrated in Ontario and Quebec, these results may not be an accurate reflection of trends in the less populous regions of the country. An indication of this is given in Chart 13 where provincial unemployment rates for the period 1979 to 1987 are plotted. They show that in 1986 labour market recovery was well underway in Ontario and Quebec as unemployment rates had been falling for three years and by 1986 were approaching their 1981 levels. In Ontario in particular, recovery was almost complete by 1986. The unemployment rate, which was in the 6.5% to 6.8% range before the recession (1979-81), had fallen from the 1983 peak of 10.4% to 7.0% by 1986. Its decline continued to a below pre-recession level of 6.1% by 1987. Recovery (as measured by the unemployment rate) was beginning in Manitoba, but was just barely evident in the Atlantic provinces and in the provinces west of Manitoba with a dropping unemployment rates for one year only.

Differences in the recovery pattern among provinces will affect changes in the wage distribution, as a more advanced recovery usually means more employment creation in the goods-producing sector, and possibly higher wage settlements due to the increased aggregate demand for labour. Many other factors can also influence wage distributions and changes in these distributions among provinces, including different industrial and occupational structures, and a generally slacker labour market in some provinces than in others. Examination of the changes in wage distributions across provinces and regions indicate important differences. The detailed distributions by province and region are presented in Table A-28. The main highlights are summarized below.

Patterns of change in the wage distribution were quite dissimilar across the country. Quebec most closely approximated the national pattern with an increased concentration of jobs in the bottom and upper middle levels of the wage distribution. Ontario experienced significant shift toward the top of the wage distribution while all the other regions experienced a downward shift over the period.

CHART 13

Unemployment Rates, Provinces, 1979–87



Between 1981 and 1986, there was little net change in total full time equivalent jobs in the Atlantic provinces (the growth rate was -0.7 percent) but there was a substantial redistribution of jobs from the upper and middle levels of the wage distribution into the two lowest wages levels which together grew from about a quarter of all jobs in 1981 to over 30 percent in 1986. An increase in jobs in level 7 was more than offset by the larger declines at higher wage levels. Overall, the share of jobs in levels 7 to 10 declined from 31 percent in 1981 to 29 percent in 1986 and all of this decline represented a shift into the two bottom wage levels.

The pattern in Quebec conforms more closely to national trends. There was significant real job growth (4.6%), an increased concentration of employment in level 1 (+3.0%) and a net shift into the upper middle part of the wage distribution (an increase of 2.4% in levels 6 to 9). A significant amount of the increase in levels 6-9 was offset, however, by a corresponding decline in wage level 10 (-2.1%).

Ontario had the highest growth rate (5.7%) of full time equivalent jobs, almost all of which were in the higher wage levels. The percentage of jobs in levels seven to ten grew from 38.4 percent to 43.5 percent. And Ontario was the only province in which the share of jobs at the top of the distribution (level 10) increased. Consistent with the national pattern, however, there was above average growth in wage level 1 and below average growth in the middle and lower middle categories.

Manitoba and Saskatchewan had a growth rate of 3.0% slightly below the national average of 3.4%. The pattern of change was such that there was a modest net decline in the share of jobs in the higher wage levels and growth at the bottom. The bottom four levels grew from 42.7 percent of jobs in 1981 to 46 percent in 1986. The largest change was in wage level 1 which increased from 8.7 to over 13 percent of all jobs.

Both Alberta and British Columbia are high wage provinces that had below average growth rates (1.3% in Alberta and a negative 2.3 percent in British Columbia). In both instances, and especially in British Columbia, there was a net redistribution of jobs from the top to the bottom of the wage distribution. In British Columbia the share of jobs in wage levels 1 and 2 increased from 12.8 percent to 18.5 percent and jobs in levels 9 and 10 declined from 30.2 percent to 23.1 percent.

These results indicate that the effects of both the downward and upward shift in wages were unevenly spread across the country. Ontario experienced a significant shift towards the top of the wage distribution. Elsewhere, there was a general decline in the wage level of jobs. Moreover, some of the general decline in wage levels evident in 1986 may have been recovered in 1987 and 1988 as the turnaround in commodity prices began to benefit the Western provinces.

Despite these regional and provincial variations in general trends there is some consistency with respect to changes in the distribution of wages by age. Everywhere in the country, including Ontario, there was a downward shift in the wage distribution of jobs held by younger workers. There was, however, considerable variation in the magnitude of these shifts.

In view of the pronounced differences in regional patterns, one might suspect that the shifts within age groups identified earlier might also be very different among regions. Though the magnitudes differ by region, the downward movement in the wages paid to younger workers is evident in all parts of the country. This is illustrated in Chart 14 where the percentage change in relative mean wages by age are plotted for six regions of the country.(27) The detailed distributions are reported in Table A29. The highlights from these tables are summarized below.

- o Among young workers (age 16-24), the share of jobs in the lowest wage levels (1 and 2) increased by 20.5% in Atlantic Canada, 19% in Quebec, 13.5% in Ontario, 18.3% in Manitoba and Saskatchewan, 22.0% in Alberta and 20.6% in British Columbia.

- o In jobs held by workers age 25-34, there was a net decline in wage levels 7 to 10 of -10.2% in Atlantic Canada, -8.0% in Quebec, -0.4% in Ontario (-3.5% in levels 9-10), -8.4% in Manitoba and Saskatchewan, -2.2% in Alberta and -14% in British Columbia.

- o Conversely, in the jobs of workers age 35-49, the percentage in levels 7-10 increased by 1.5% in Atlantic Canada, 2.0% in Quebec, 9.4% in Ontario, (chart sixteen)

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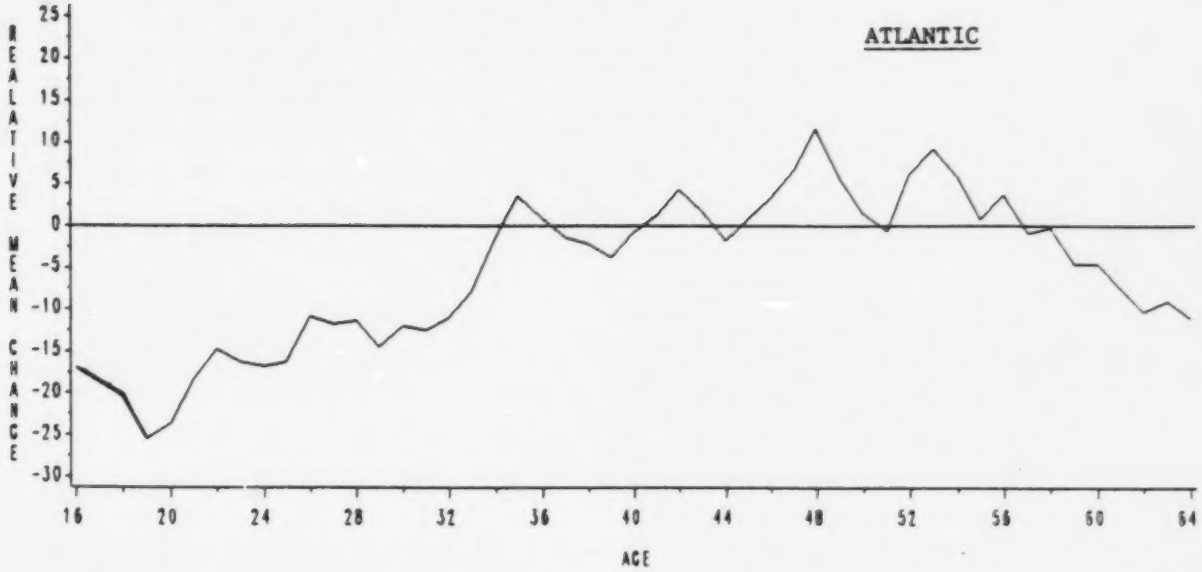
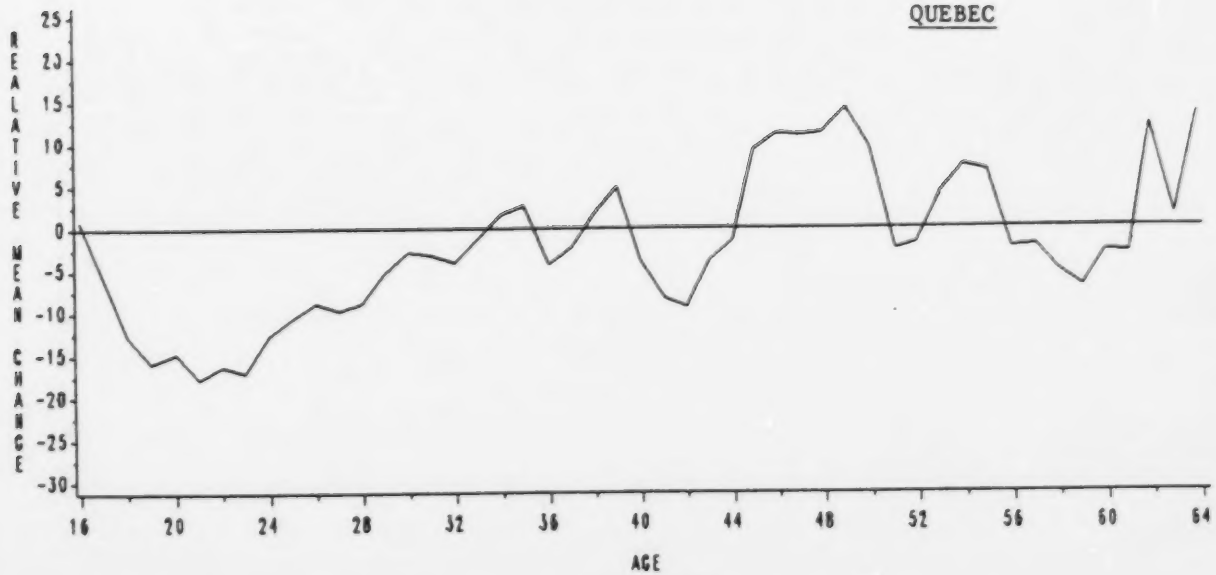
(27) *Estimated relative to the national mean.*

CHART 14

PERCENTAGE CHANGE IN RELATIVE* MEAN WAGES, BY AGE AND REGIONS, 1981-86
FULL-TIME JOBS, THREE YEAR MOVING AVERAGE



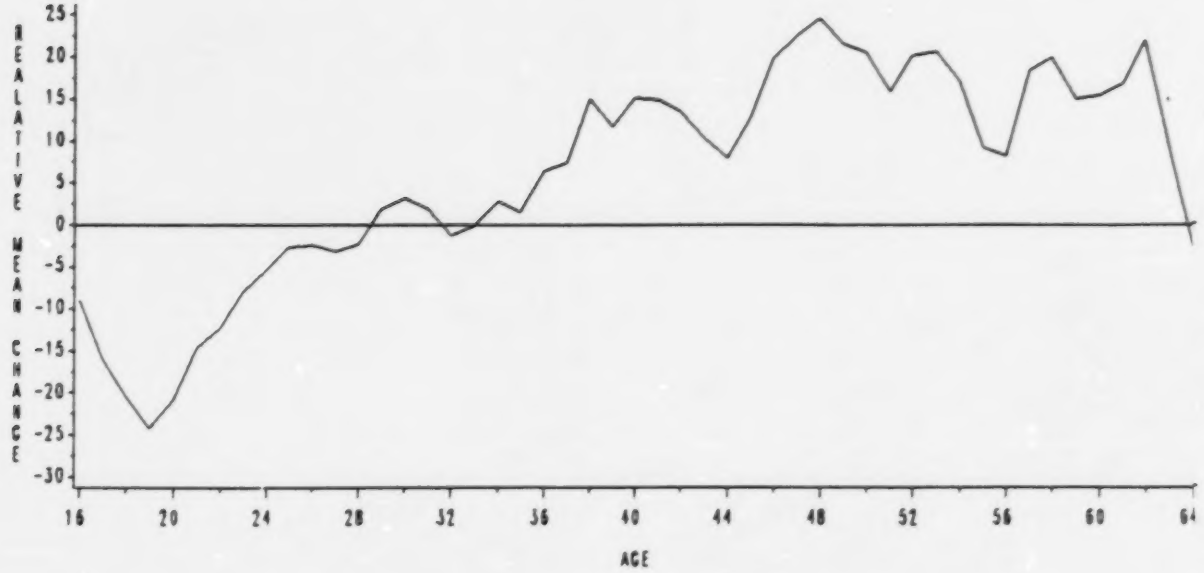


* Relative to the national mean, not the regional means

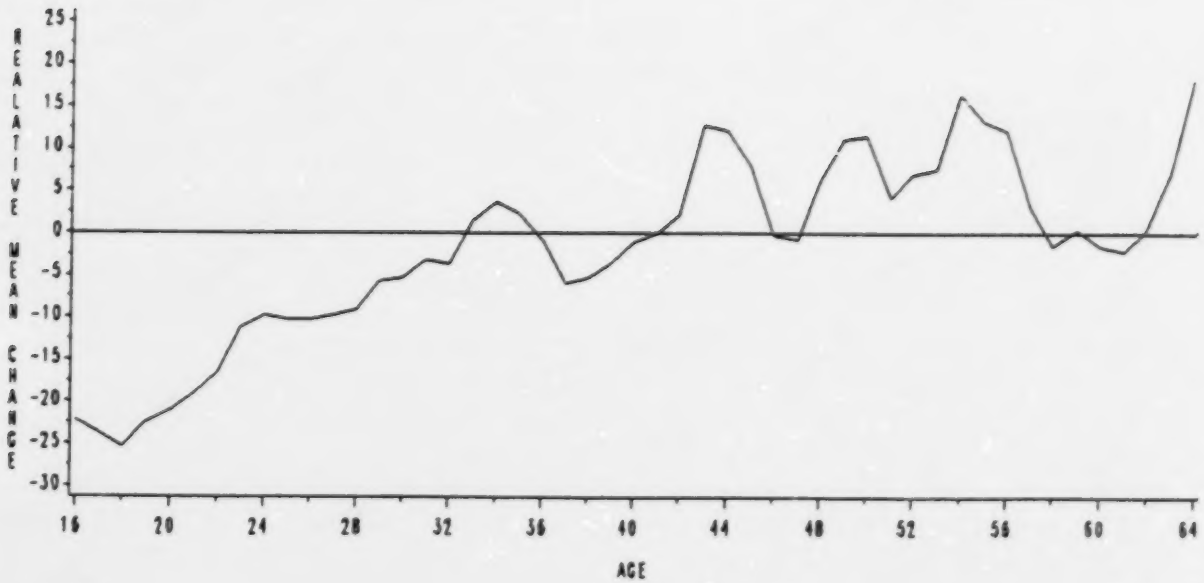
CHART 14 - continued

PERCENTAGE CHANGE IN RELATIVE* MEAN WAGES, BY AGE AND REGIONS, 1981-86
FULL-TIME JOBS, THREE YEAR MOVING AVERAGE

ONTARIO



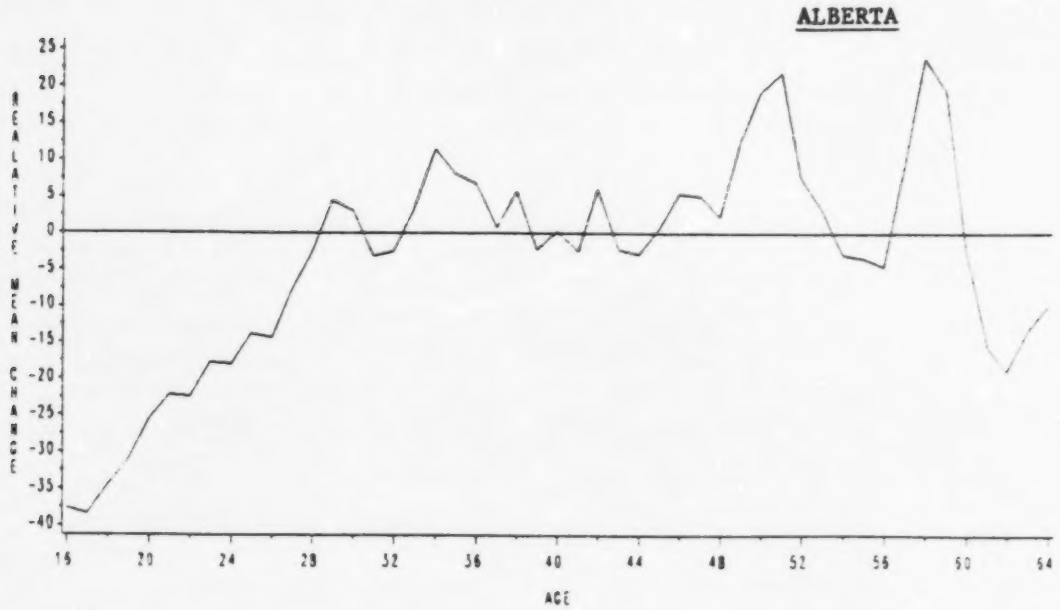
MAN./SASK.

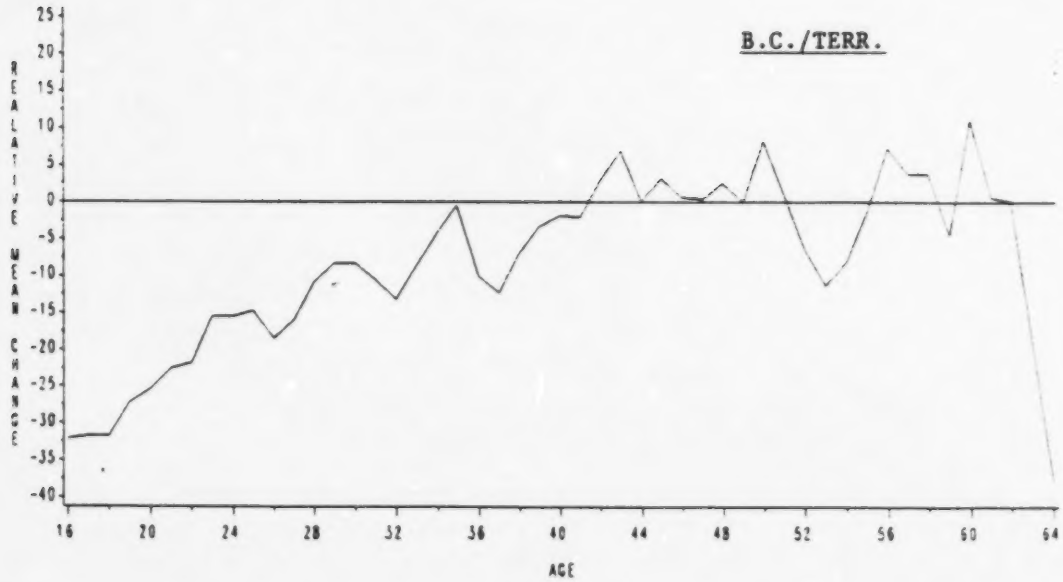


* Relative to the national mean, not the regional means

CHART 14 - concluded

PERCENTAGE CHANGE IN RELATIVE* MEAN WAGES, BY AGE AND REGIONS, 1981-86
FULL-TIME JOBS, THREE YEAR MOVING AVERAGE





* Relative to the national mean, not the regional means

3.2% in Alberta and 3.2 % in British Columbia. There was virtually no change (-0.2%) in Manitoba and Saskatchewan.

- In the jobs of workers age 50+, the share in levels 7-10 increased by 3.2% in Atlantic Canada, 6.3% in Quebec, 13.8% in Ontario, 6.4% in Manitoba-Saskatchewan, and 6.5% in Alberta. In British Columbia, there was a decline of -1.5%.

Thus, while the magnitudes differ, the general pattern of change in the wage distribution of jobs within age groups does not. This suggests that the shifts within age groups cannot be reduced to regional differences in recovering from the effects of the recession. In regions where there was a general decline in relative wages, virtually all of the impact was experienced by younger workers and there was little change in the relative wages paid to older workers. Where there was a general improvement in relative wages (compared to the national average wage) -- as in Ontario -- the upward shift mainly affected older workers and the relative wages paid in jobs held by younger workers declined, although not as much as in other provinces.(28)

Ontario is obviously a special case, since recovery was much more complete by 1986 than in most other provinces. Because of this, a more complete analysis of the change in the wage distribution in Ontario alone is conducted.

The Changing Wage Distribution in Ontario

To approximate a more complete business cycle than is possible for Canada as a whole using 1981 and 1986 data, Ontario is treated as a separate unit. It has already been observed that the unemployment rate for Ontario as a whole had almost fallen to its pre-recession level by 1986 in Ontario. Among its young people (15-24), the unemployment rate was 12.3% in 1981, rising to a peak of 17.8 in 1983, then falling to 11.5% by 1986, which was below the pre-recession level (Chart 15). Hence, recovery was quite advanced in Ontario by 1986.

How then, did the shape of the wage distribution in this province change over a period which more closely approximates a business cycle than was the

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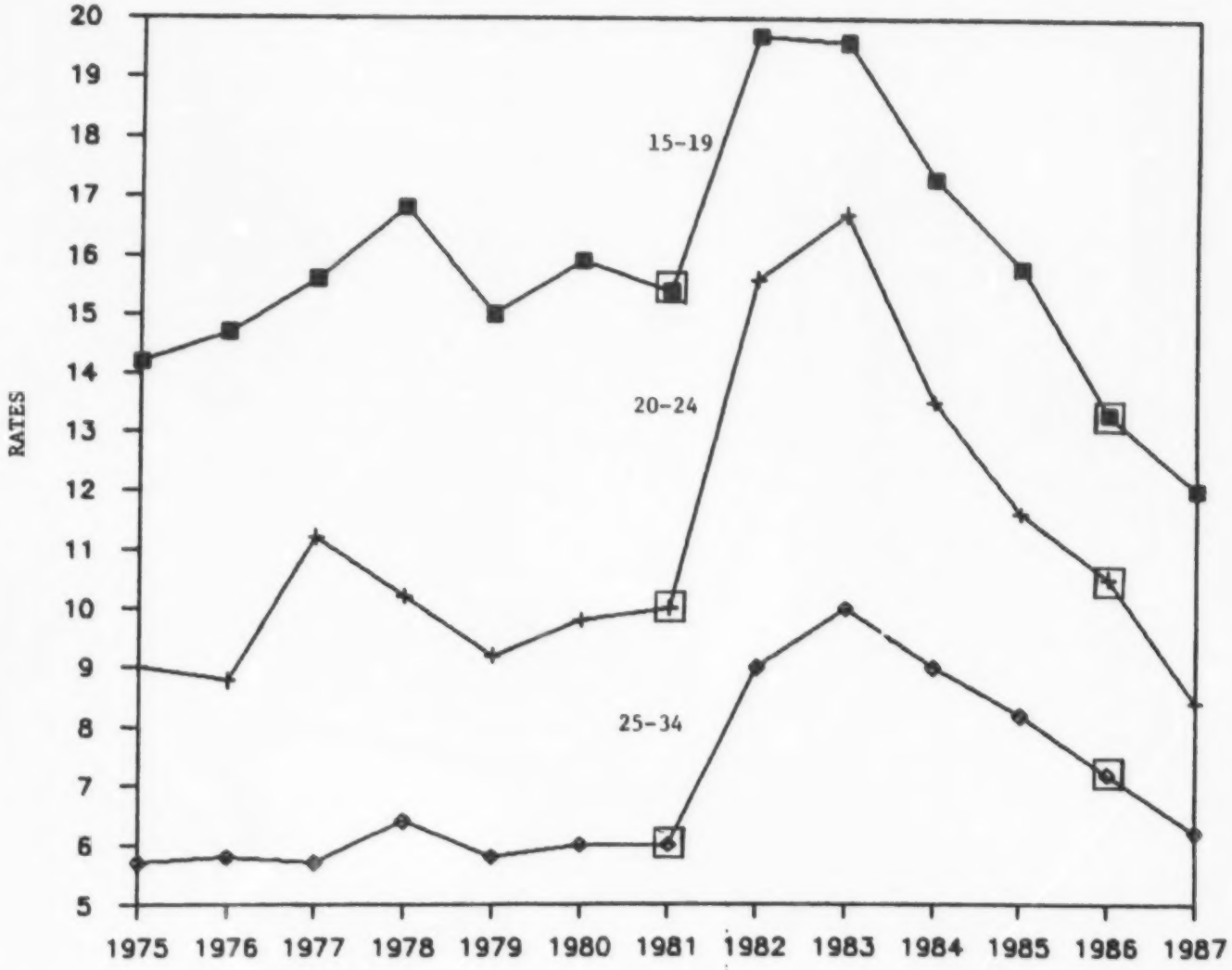
(28) *It is important to recall, of course, that here and throughout this report the changes we have been describing refer to relative wage levels. Since real wages fell by 1.4% over the period, a drop in relative wages also means a drop in real wages.*

CHART 15

UNEMPLOYMENT RATES, BY AGE, ONTARIO, 1975 to 1987



case in, say, the western provinces? Was the change which was observed caused by the change in the industrial composition of employment (e.g., increase in service sector jobs)? And was the phenomenon of declining relative wages among the young as persistent throughout the 1981-86 period in Ontario as elsewhere in Canada in spite of the more complete recovery? These are the questions addressed in this section.

One methodological note is necessary. In the earlier regional comparisons, all changes in regional wages were related to overall national trends. For example, the change in the shape of the regional wage distributions between 1981 and 1986 was observed after accounting for the change in the national median wage (i.e., the change in the national median wage was used to inflate the wage boundaries for all regions). Similarly, the change in the relative mean wage rates was computed by relating the change in the wage rate for a specific age group in a region to the change in the overall national mean wage rate.

It was necessary to use the same national value for the deflator in these calculations so that comparisons could be made among provinces. In this section, however, comparisons among provinces are not of interest. Here we are treating Ontario as a separate unit, and want to assess what occurred in that region alone. Hence the deflators used in the calculations are Ontario-specific, not national deflators.(29) This provides a somewhat different interpretation of the results from those presented earlier, since both median and average wage increases were greater in Ontario than for Canada as a whole.(30)

---

(29) *That is, the change in the median wage in Ontario (not Canada) is used to inflate the wage boundaries before comparisons of the 1981 and 1986 distributions are made, and the change in the relative mean wage rate is computed using the change in overall average wage in Ontario (not Canada).*

(30) *Between 1981 and 1986, the median wage increased 34% for Canada as a whole, and 41% in Ontario.*

The Change in the Aggregate Wage Distribution

When the analysis relates only to Ontario and an Ontario-specific wage deflator is used, between 1981 and 1986 the distribution of FTE jobs by hourly wage became more concentrated at the very bottom of the wage distribution, and in the upper middle of the distribution. This is similar to the results for Canada as a whole.

Approximately 195,000 FTE jobs were added to the Ontario economy between 1981 and 1986, a net increase of 5.7%. More of these jobs (179,000) were added at the two bottom wage levels than elsewhere in the distribution, resulting in their share of total jobs increasing by 3.9 percentage points (Table 9). There was also an increase of 135,000 jobs at wage levels 7, 9 and 10 , collectively.(31) Hence, there were two pockets of job growth, as there was at the national level. There was a decrease in the number of jobs at all other wage levels.

Most of the increase in employment between 1981 and 1986 was in the service sector, notably the consumer services (in Ontario as it was in Canada). Also, as in Canada as a whole, this movement to the services accounted for relatively little of the change in the wage distribution just outlined. Most resulted from change in the wage distribution within industries.

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(31) *It was noted earlier when using the national deflator (i.e., change in the national median wage) that most of the movement in Ontario's wage distributin was to the top. The reason for the difference in findings is that the national median wage increased 35.4% between 1981 and 1986, while Ontario's median wage rose 41.7%. Hence, in relation to the overall wage gains in Canada as a whole, the jobs created in Ontario were relatively high paying and this increasedthe top of the wage distribution. however, in relation to the overall wage gains in Ontario, many of the jobs created were very low paying, and this altered the shape of distribution such that there was increased concentration at the bottom and upper middle. If one is interested in changes in the shape of Ontario's Ontario's aggregate wage distribution, as we are here, the Ontario deflator should be used. If comparisons with jobs created in other provinces is the focus of the exercise, as it was earlier, the national deflator is used.*

TABLE 9. CHANGE IN THE DISTRIBUTION OF F.T.E. JOBS BY WAGE LEVEL, ONTARIO,* 1981-86

HOURLY WAGE LEVEL **	NET CHANGE IN F.T.E. JOBS	PERCENT DISTRIBUTION IN 1981	PERCENT DISTRIBUTION IN 1986	CHANGE IN SHARE
1	98054	10.0	12.2	2.2
2	81331	9.2	10.9	1.7
3	-45224	10.6	8.8	-1.8
4	-49765	10.8	8.8	-1.9
5	-8860	10.4	9.6	-0.8
6	-2253	10.6	9.9	-0.6
7	80872	8.8	10.6	1.8
8	-12337	11.5	10.5	-1.0
9	24461	9.9	10.0	0.1
10	28872	8.3	8.6	0.3

* Using the Ontario median wage as the deflator.

** The wage level boundaries are as follows:

1981: $3.87/hour, 4.99, 5.89, 6.81, 7.71, 8.77, 9.99, 11.51 and 14.34

1986: $5.48/hour, 7.07, 8.34,0.92, 12.43, 14.16, 16.30 and 20.32

The share of FTE jobs in the services sector increased by 4 percentage points in Ontario between 1981 and 1986 (as it did in Canada), with the business services, health/education and consumer services sectors accounting for the largest increase in the share of employment (1.4, 1.4 and 1.0 percentage points respectively). In spite of this considerable shift in the mix of jobs, the decomposition technique outlined earlier demonstrated that 83% of the change in the share of jobs in the various wage levels was due to the changing wage distribution within industries, and only 13% to changes in the mix of jobs among industries.(32)

Changes in Wages Among the Young in Ontario

> The change in the distribution of jobs by hourly wage was dramatically different among age groups in Ontario as it was for Canada. Among the young (16-24), there was a disproportionately large increase in jobs with very low hourly wage rates, while among workers over 35 the movement was in the opposite direction, towards a larger share of jobs at the top of the wage distribution.

The pattern of change in the wage distribution by age group was very similar in Ontario to that observed for Canada as a whole. All of the increase in jobs for 16-24 year olds was in the lower two wage levels, increasing their share by 12.4 percentage points over the period. Among persons over 35, however, the wage levels which increased their share of jobs were at the top of the wage distribution (mainly levels 7, 8, 9 and 10) (Table 10).

The decomposition technique, when applied to the change in shares of jobs at different wage levels among 16-24 year olds, confirm once again that it was not primarily the change in job opportunities among industries which is causing the downward shift in the wage distributin among the young in ontario. Only 16% of the overall change in the shape of the youth wage distribution was accounted for by this factor. Most (72%) of the change was due to changes in the wage distribution within industries. And while there were downward shifts in the wage distribution in virtually all industries for young people, the most dramatic change occurred in the already low-paying consumer services sector.

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(32) *The same industry and wage levels were used as in the decomposition for Canada as a whole.*

TABLE 10. CHANGE IN THE WAGE DISTRIBUTION OF F.T.E. JOBS, BY AGE, ONTARIO,* 1981-86

HOURLY WAGE LEVEL	16-24		25-34		35-49		50+	
	1986 DISTRIBUTION	CHANGE 1981-86	1986 DISTRIBUTION	CHANGE 1981-86	1986 DISTRIBUTION	CHANGE 1981-86	1986 DISTRIBUTION	CHANGE 1981-86
1	22.6	7.6	6.7	-0.2	7.3	0.6	6.6	-1.3
2	16.8	4.6	8.3	2.4	6.7	-1.3	8.7	-0.3
3	13.1	-1.3	7.6	-0.4	6.2	-2.4	5.7	-3.5
4	9.5	-2.1	8.6	-0.9	7.5	-3.3	9.2	-1.5
5	10.4	-0.8	9.4	-0.8	8.9	-0.3	9.1	-1.1
6	9.4	-0.9	10.3	-0.3	9.7	0.0	10.7	-1.2
7	7.2	-0.4	12.6	4.1	10.6	-0.2	13.8	4.1
8	5.8	-2.5	13.8	-0.5	13.2	0.8	11.3	-1.4
9	3.9	-2.4	12.7	-0.9	15.2	2.9	11.5	2.3
10	1.2	-1.7	10.0	-2.5	14.8	3.2	13.4	3.9

* USING THE ONTARIO MEDIAN WAGE AS THE DEFLATOR

The proportion of jobs in the very lowest wage level increased by 20 percentage points in this industry grouping. In 1981 40% of all FTE jobs held by young people in that industry were in the lowest wage level, where as by 1986 this had increased to 60%. Once again, this is similar to what occurred for Canada as a whole.

Other industries with significant downward shifts in the wage distribution for the young in Ontario included the higher paying health/education sector (where the share of jobs in the bottom wage level increased 12 percentage points), public administration (12 percentage points) and manufacturing (6 percentage points).

Changing Relative Wages over the Period

It has been shown that all of the growth in jobs among the young took place at the very bottom of the wage distribution, while among older workers the growth was at the upper middle of the distribution. Another way of looking at the disproportionate growth of low wage jobs among the young is to compute the change in the relative mean wage for all age groups.(33) If the average wage grew at the same rate in all age groups, the line on Chart 16 would be perfectly horizontal, with all ages showing 0 percent change in the relative(34) wage rate. But wage rates among the young grew much more slowly. Hence, their relative wages fell by 15% to 20% in Ontario, while among persons over 35 the relative wages increased by from 1 to 10%. As for Canada as a whole (see Chart 3), the relative mean wages of the young fell substantially between 1981 and 1986.

But what happened during the intervening years? The analysis largely focuses on changes between two specific years. This is by necessity; these unique data are currently only available for these two years. It is conceivable that the major change in youth wages occured between, say, 1981 and 1983, and by 1986 they were already recovering from their earlier low relative levels because of increased demamd for youth labour, as the recovery strengthened in Ontario.

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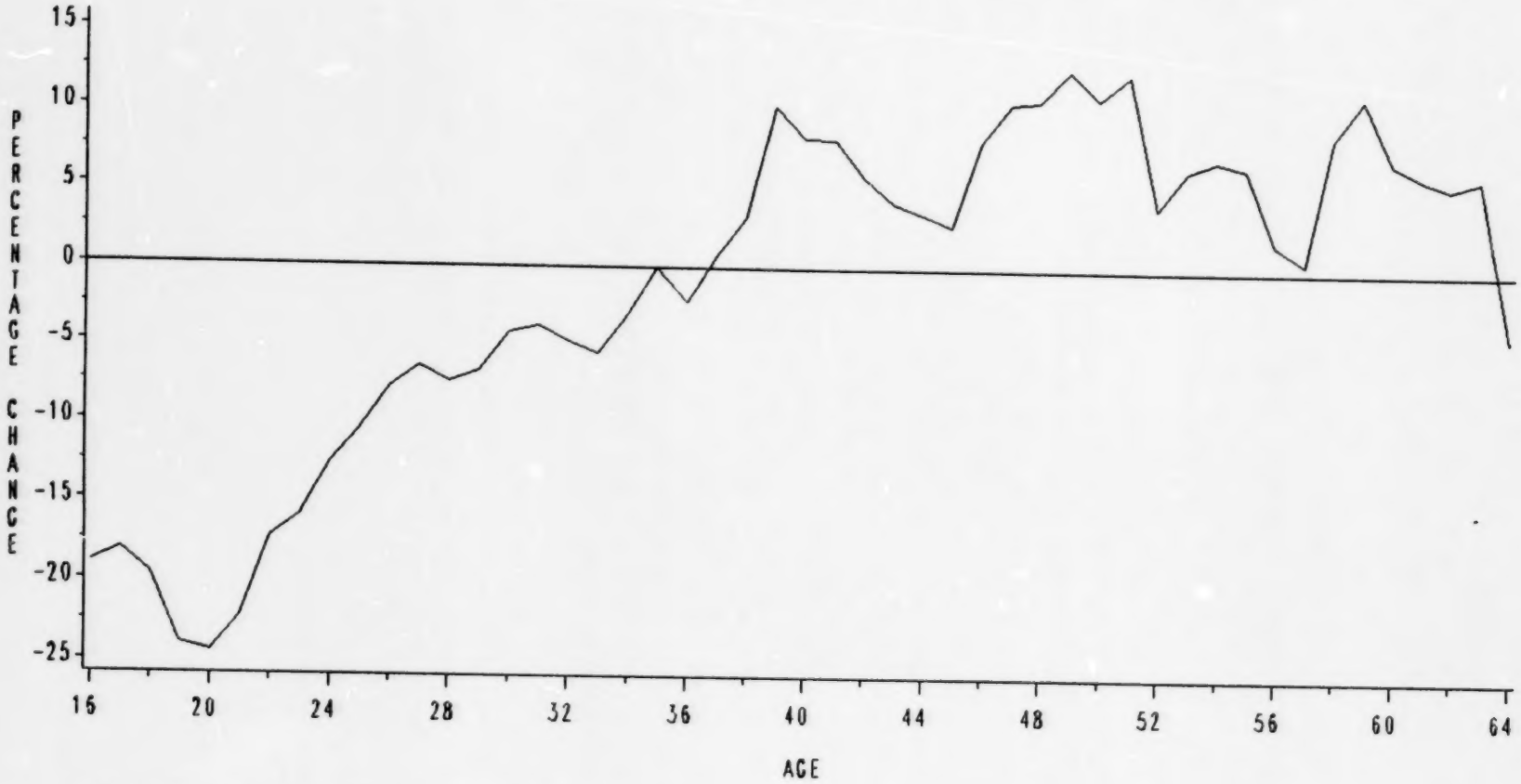
(33) *See page 26 for a description of how this is calculated.*

(34) *Relative to the change in the Ontario average wage between 1981 and 1986.*

CHART 16

PERCENTAGE CHANGE IN RELATIVE* MEAN HOURLY WAGES BY AGE, ONTARIO, 1981-86
THREE YEAR MOVING AVERAGE



* Relative to the change in the provincial mean wage rate

To assess this possibility, annual data from the Survey of Consumer Finance is used to calculate the change in the relative mean wage rates for different age groups. The change is always calculated in relation to the relative mean wage rates observed in 1981, and the results are plotted in Chart 17.

> The relative mean wages of the 15-24 year olds working in full-time full year jobs began falling in the early 1980's, and by 1986 were approximately 12% lower than in 1981. There is no clear pattern of either upward or downward movement[35] since 1983.

It is necessary to await data for years beyond 1986 to determine how quickly youth's relative wages will recover. It is quite evident, however, that yough wages were very flexible downwards during the 1980's. This is discussed more fully in the conclusion when data similar to these are displayed for Canada.

Ontario Trends Similar to those for Canada

In the Ontario economy, where recovery was much more advanced in 1986 than elsewhere in the country, particularly western Canada and the east coast, the same general patterns of change in the wage distributions are observed as for Canada as a whole.

- o there was movement out of the lower middle of the hourly wage distribution to both the very bottom and the upper middle.

- o the increased concentration of jobs at the bottom occurred mainly among the young, while the increase at the upper middle on top occurred mainly among older workers.

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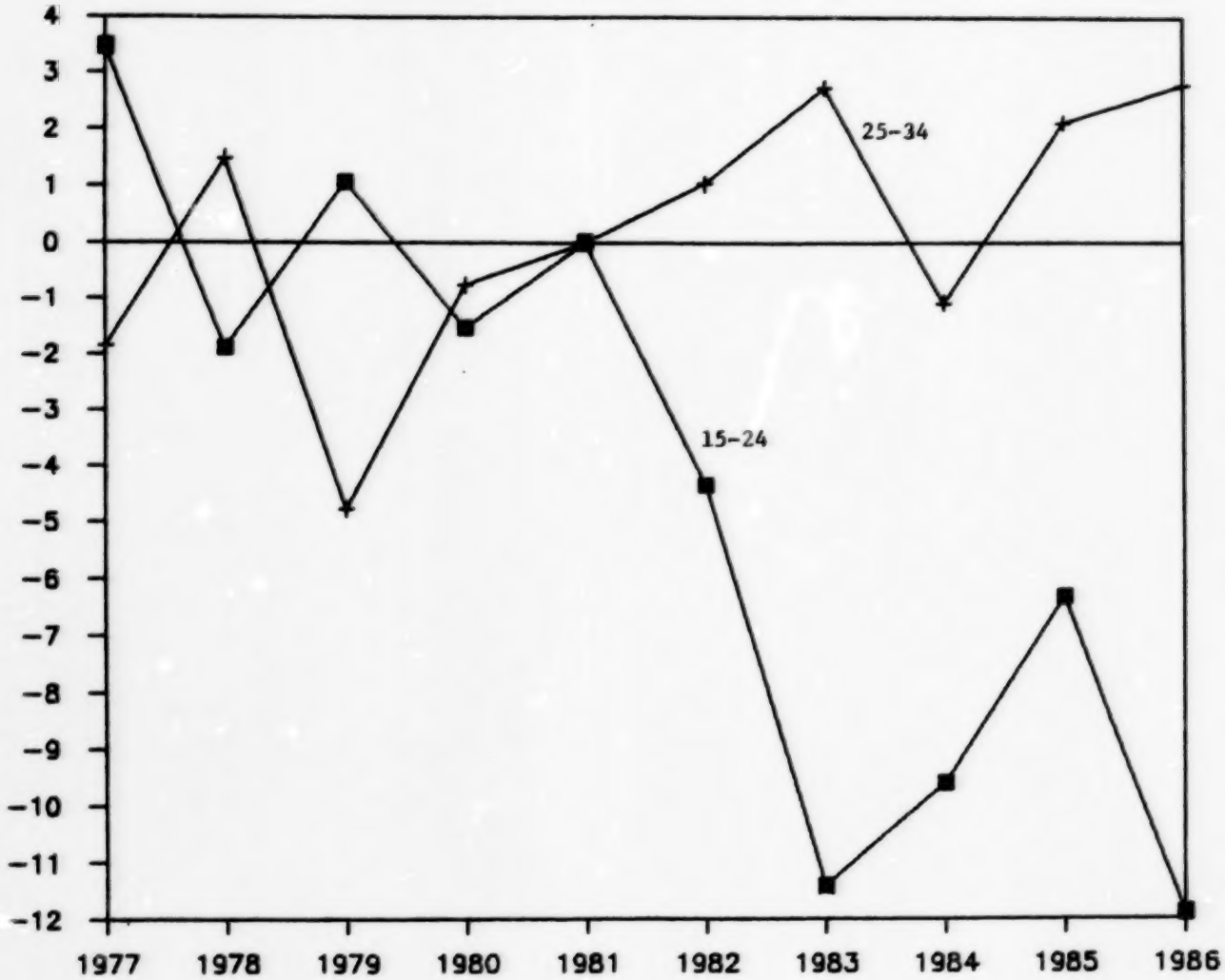
(35) Also, there is significant statistical variation in these data, as the sample sizes are quite small.

CHART 17

CHANGE IN RELATIVE MEAN EARNINGS, FULL-TIME FULL YEAR WORKERS, BY AGE,
ONTARIO, 1977 TO 1986



- the changing mix of jobs among industries does not explain much of this movement in the wage distribution, either for the Ontario economy as a whole, or among young people.

- the declining relative earnings of young people appear evident for most years between 1981 and 1986. Only time will tell to what extent youths relative wages will recover.

CONCLUSION

What of the "declining middle" hypothesis? Over this five year period, which was quite unique in many ways, there was some contraction of the number of jobs in the lower middle of the wage distribution and expansion in the very bottom and upper-middle. Our examination of the earnings (as opposed to hourly wage rate) distribution also indicates movement out of the middle and expansion in both the top and bottom (Appendix I). Is this a continuation of a longer-term trend or is it unique to this period, and will this result change as recovery continues? It is quite true that studies which focus on two end points can come to somewhat different conclusions regarding long-term trends when different end points are selected (possibly at different points in the business cycle). However, there is some evidence from Leckie's study (1988) that similar shifts in the earnings distribution were occurring during the 1970s. He observed that the proportion of workers in his middle income group[36] decreased by 1.5 percentage points between 1971 and 1981. American studies of the longer-term (say, 10 to 20 years) have concluded that the proportion of earners in the middle earnings levels has declined somewhat in that country (e.g., Lawrence, 1984; Harrington and Levinson, 1985; Bluestone and Harrison, 1985; Bradbury, 1986; Gillman and Dunkerley, 1988)but others disagree (Kosters and Ross, 1988). We plan to use census data to examine trends over the 1971-86 period to try to answer this question for Canada in a future paper, as well as using new data for 1987 from the Labour Market Activity Survey when they are available.

Are the magnitude of the shifts in the economy-wide wage distribution significant? Given the very short period (five years) over which the changes that were documented here occurred, they do seem to indicate that significant events were occurring in the economy to produce such change in a short period. To have the proportion of jobs in the bottom wage level rise from 9.5% to 12.1% in just 5 years, signifies some significant change. It may be as recovery continued during 1987 and 1988 that some part of the shift was reversed. To assess the likelihood of this requires some understanding of what forces caused the change.

It seems that Canada's "declining middle" (or lower middle) is not a pervasive phenomenon affecting all groups equally. Rather, for this period at

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(36) Defined as from 85% to 115% of the median wage.

least, it was largely created by dramatic shifts in the distribution of wages paid to workers in different age groups -- downward movement in the relative wages of youth and some upward movement in the relative wage rates of older workers[37]. The polarization in the wage distribution was not occurring among adult workers in general. One might say that the changes in the aggregate economy-wide distribution, while significant, are in fact masking the even greater changes which have taken place among age groups.

Canada's success in increasing employment during the recovery to 1986 was a result of employment growth in services. Among young people, and growth was particularly strong in low wage consumer services, while for older workers it was concentrated in the health/education/welfare sector. Part-time employment grew, especially at the beginning of the period, contributing to job growth at the bottom of the wage distribution. But these changes in employment patterns, though significant in themselves, account for only a modest share of the changes in the wage distribution between 1981 and 1986. Industrial restructuring and the growth of part-time work were not without effects but the magnitude of these effects pale in comparison to the changes that occurred across the whole economy in full-time jobs in all industries and in all occupational groups. For example, the real impact of the consumer services sector on the creation of low wage jobs for young people was not so much that a lot more people were working in the sector (which they were), but rather that the wages paid in full-time jobs in the sector shifted downwards.[38]

The conclusion that it is events occurring <u>within</u> most or all industries which are important is supported by American research as well (Kerff, 1986; Lawrence, 1984 and Tilly, Bluestone and Harrison, 1986).

Will these trends continue in the future? This is equivalent to asking

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(37) Earnings data presented in Table A-30 indicate that the increase in relative <u>earnings</u> among older workers over the period has been relatively small, and not as great as the increase in relative <u>wage rates</u>. These differences relate to changes in hours worked per week, and probably more importantly, the number of weeks per year older people work.

(38) In retail trade, the largest single component of the consumer services sector, the real average weekly earnings of hourly wage workers (2/3 of all workers) <u>fell</u> by 8% to 12% between 1981 and 1986. Among the salaried employees, who are likely to be in the older age groups than the hourly wage workers, real earnings <u>rose</u> by from 2% to 6%. This is based on SEPH (Survey of Employment, Payroll and Hours) data.

whether the observed shifts in the wage distribution among the young and old are temporary or permanent.

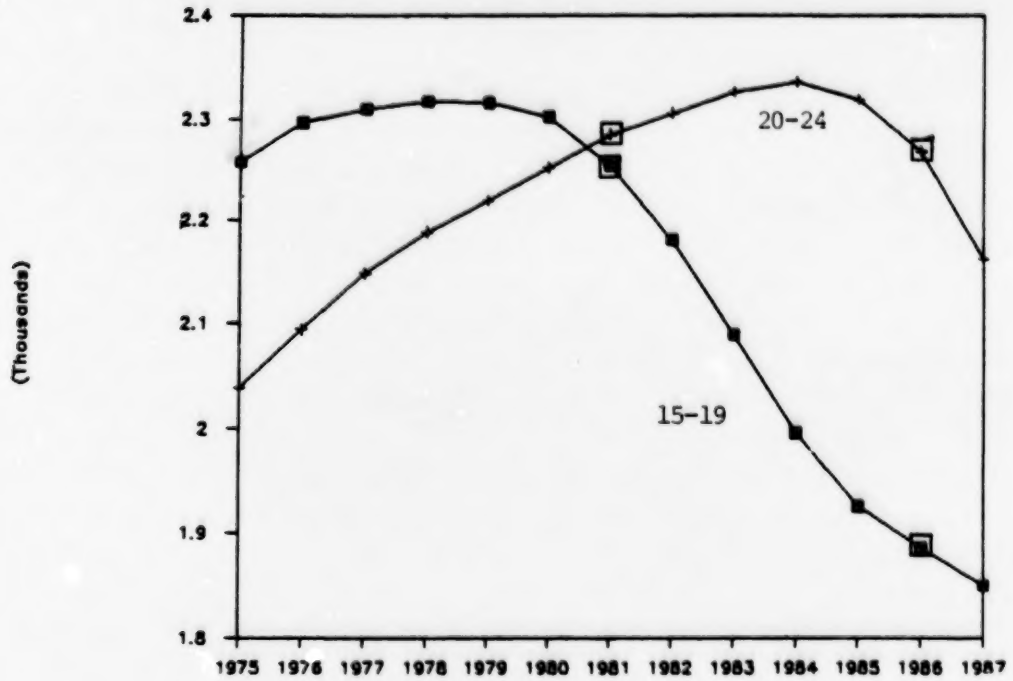
Among the young, the pattern observed here continue a trend that has been evident since the seventies (Kennedy, 1987a, 1987b), and one that has been evident in the United States (Bluestone and Harrison, 1988; Kosters and Ross, 1988; Levy and Michel, 1986). What these results dramatize is just how downwardly "flexible" youth wages have been in Canada over this period. During the seventies, the decline in youth wages was generally attributed to "generational crowding" -- intense wage competition resulting from the very large numbers of young people in the "baby boom" cohorts (Foot and Li, 1988; Levy and Michel, 1986). However, between 1981 and 1986, the number of Canadians aged 15-24 declined by almost half a million (from 4.7 million to 4.2 million) and the youth labour force fell from 3.1 to 2.8 million (the participation rate rose slightly from 67.7% to 68.5%. In short, the youth labour market was decidedly less "crowded" in 1986 than in 1981 (Chart 19).

But the generational crowding thesis may still apply. It may well be that the very large cohort of young "baby boom" adults (age 25-34) is continuing to exert downward pressure on wages in the youth labour market (Foot and Li, 1986:504). Perhaps competition from these large numbers of young adults in the entry level or near entry level job market is depressing the wages of the under 25 year-olds. It may be necessary, however, to look beyond this supply side account to the demand side of the labour market as well.

It is instructive to consider the experience of the larger European economies during this period. As in Canada, the onset of recession resulted in sharp increases in unemployment generally and of youth unemployment in particular. After 1983, however, youth unemployment in Canada began to decline again returning to almost pre-recession levels in 1986 (Chart 19). Population/employment ratios fell from 58.8 in 1981 to 52.9 in 1983 but had returned to 58.2 by 1986. This turnaround did not occur in the large West European economies despite recovery. Between 1980 and 1985, youth unemployment rose from 15.0% to 25.6% in France, from 3.9% to 9.5% in Germany, from 14.1% to 21.7% in the U.K., and from 25.2% to 33.7% in Italy. And in 1986, youth unemployment was actually higher in all of these countries except Germany where the rate declined to 8.3% (Auer, 1988:47). The European experience is not generally attributed to supply-side factors such as the size of the youth cohort (the European "baby boom" was typically smaller and peaked sooner than in North America and especially Canada) but to a general slowdown in employment

CHART 18

POPULATION BY AGE, CANADA, 1975-1987



LABOUR FORCE BY AGE, CANADA, 1975-1987

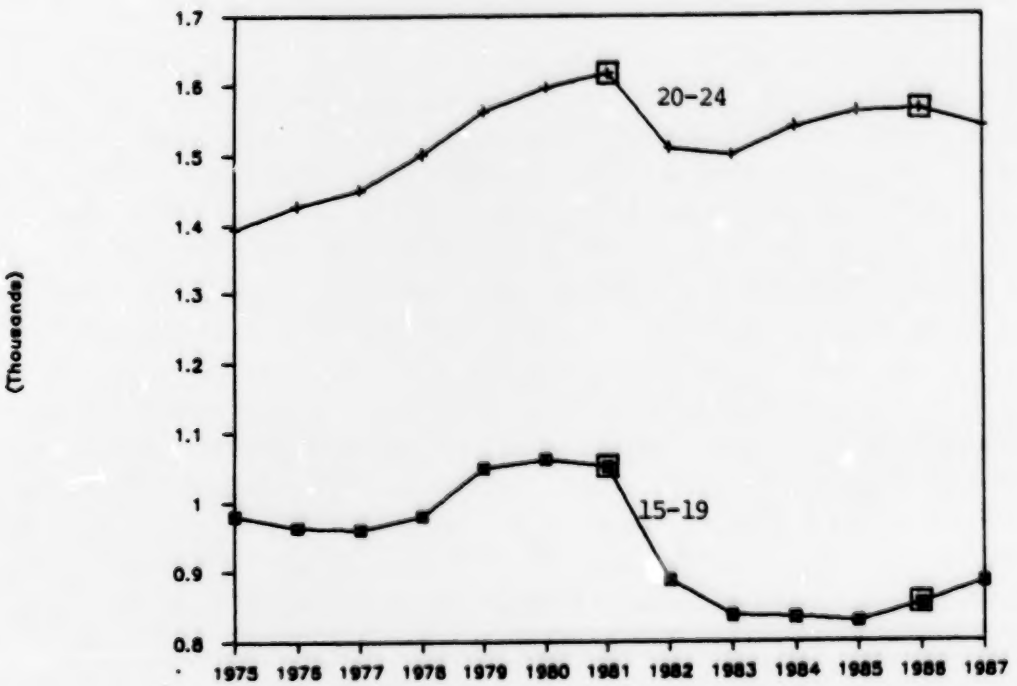
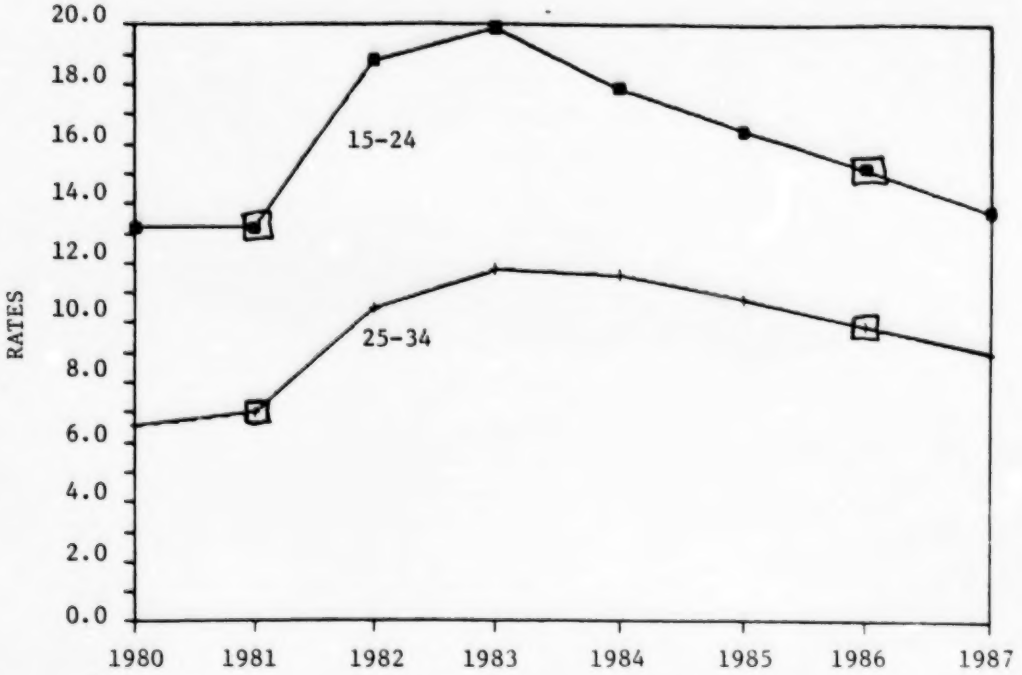
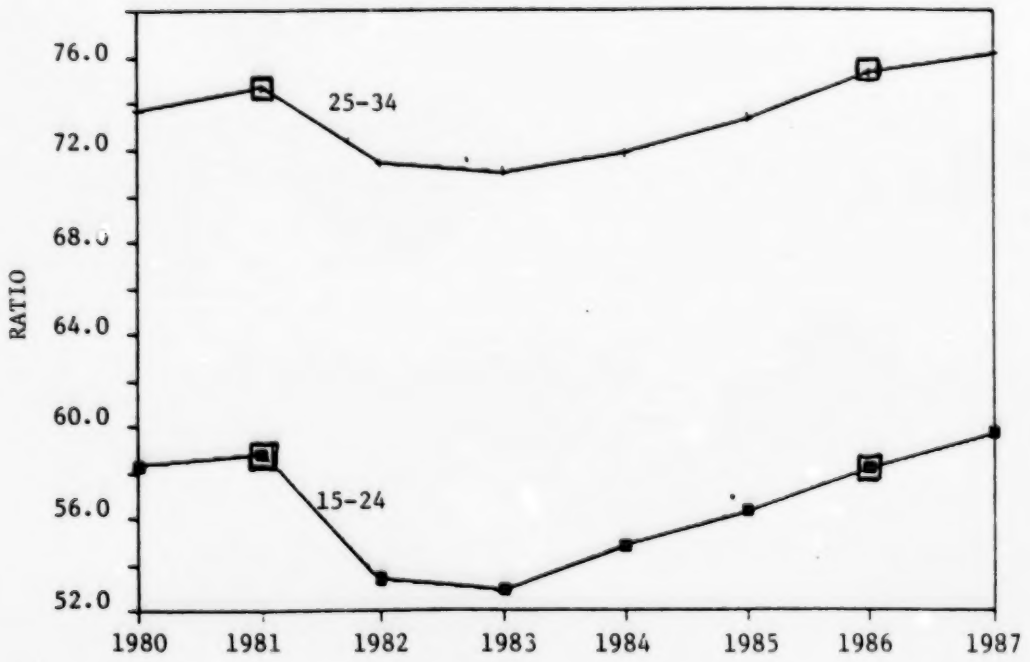


CHART 19

UNEMPLOYMENT RATES, YOUNG WORKERS, 1980 to 1987



EMPLOYMENT POPULATION RATIO, YOUNG WORKERS, 1980 to 1987



growth and reduced intake of new workers. This in turn is frequently attributed to continued increases in real wages and the ability of organized labour to prevent wage erosion (Rees, 1986:619; Ellman, 1987). These are matters over which there is considerable debate (see Gunderson, Melz and Ostry, 1987) on which we do not intend to take a position here.[39] Nor do we wish to create the impression that there is no alternative to an exchange between wages and jobs, a fact exemplified by the experience of the smaller European economies notably the Scandinavian countries, Austria and Switzerland.

It is instructive to note, however, that the Canadian pattern is, in some ways, the mirror image of that found in the larger European economies. In Canada, youth unemployment rose until 1983 and then began to decline. At some point shortly thereafter, one might expect the relative wage position of young people to start to improve. In Chart 20, we present data from the Survey of Consumer Finances on changes in relative mean earnings for selected years between 1977 and 1986.

They show a very dramatic decline in relative mean earnings[40] among both 15-19 year-olds and 20-24 year-olds which continued over the 1981-86 period, and had in fact started in the late 1970s. Since real earnings for all workers changed very little between 1981 and 1986 (-1.4%), these data also roughly indicate the change in real earnings for these age groups. Relative (and real) earnings among 15-19 year-olds in full-time full-year jobs were in 1986, in the order of 15% lower than in 1981, and around 27% lower than in 1977. There were also dramatic declines among 20-24 year-olds, as their relative (and real)

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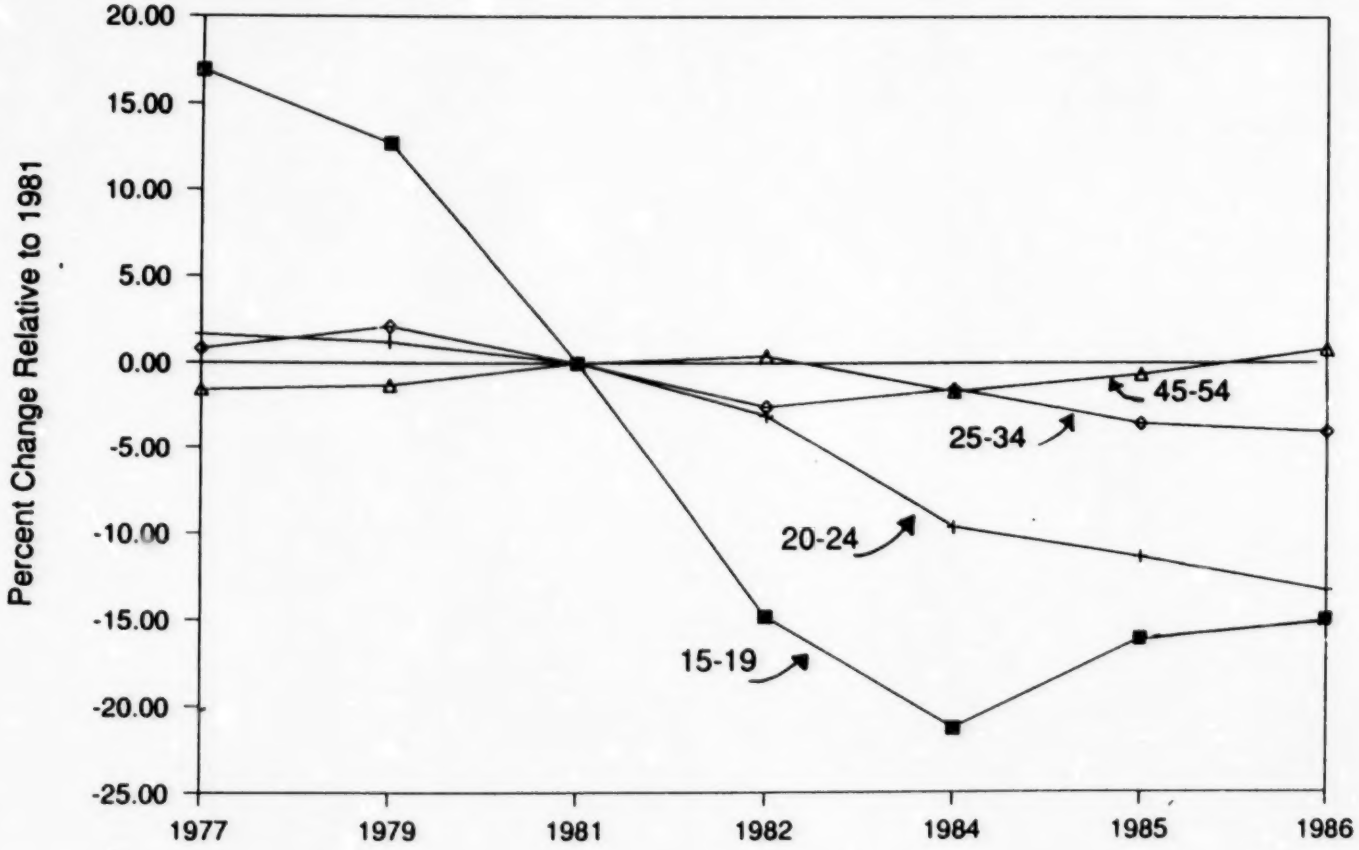
(39) *Tobin (1987), for example, argues that a lack of aggregate demand, not high wages is responsible for continuing high unemployment in Europe.*

(40) *The rates of the average earnings in an age group to the average earnings for all earners.*

CHART 20

The Relative Mean Wage, Percent Change Relative to 1981, Full-time Earners Only by Age Group, 1977-86



earnings were around 13% to 15% lower in 1986 than 1981. These changes were even more dramatic among all earners (full-time plus part-time) in this age group as shown in Table A-30. The magnitude of these declines in earnings are similar to those reported for changes in relative wage rates among the young earlier in the paper.(41)

The implication of the unemployment and earnings data combined is that Canadian youth recovered pre-recession unemployment rates, but at the cost of an erosion in relative (and real) wages and earnings. This pattern is understandable early in the recovery, but youth wages show only an almost insignificant recovery(42) over the 1984 to 1986 period, in spite of a declining supply of workers and declining unemployment rates. It was shown earlier that this is also true in Ontario, where recovery was very strong by 1986, and youth unemployment rates were below their pre-recession level.

The very low demand for labour in the early to mid-1980's, particularly among entry-level youths, combined with the relatively high (although declining) supply of young workers would have resulted in economy-wide downward pressure on wages among the young in the early 1980's. It may be that there is a substantial lag in the recovery of wage rates even after labour demand starts to increase, unemployment falls, and supply declines (as occurred over the 1984-86 period). Thus, as recovery continued in 1987, 1988 and perhaps 1989, and the supply of young workers continues to fall, the relative wages of young people may also recover to some degree. Will they return to anything approximating their 1970's level? That is difficult to say, and requires patience to answer.

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(41) *Earnings data from both Survey of Consumer Finances and Census data indicate a downward trend in earnings similar to that found in wages in the younger age groups, but the upward shift in earnings for older employees is considerably less than that observed for wages. As measured by the census, the relative mean earnings of 16-25 year-old workers declined by 16% (.49 to .41), and of 25-34 year-olds by 7% (1.03 to .96) between 1980 and 1985. In contrast, relative mean earnings of those 35-49 barely changed (from 1.28 to 1.27) and earnings of those 50+ increased slightly (from 1.20 to 1.22). Changes in relative mean earnings from the Survey of Consumer Finances are shown in Chart 16. The differences between wages and earnings and different data sources are discussed at length in Appendix A.*

(42) *A modest recovery in the relative wages of 15-19 year-olds, and continued decline among 20-24 year-olds (Chart 20).*

This analysis has shed some light on some of the questions regarding the cause of the changing wage distribution in general, and the declining relative wages of youth in particular.

Two factors usually given considerable emphasis in "demand-side" accounts -- industrial restructuring and the growth of part-time employment -- do matter but leave most of the change in wages unexplained. And the simpler versions of "generational crowding" or "supply side" thesis need to be altered in order to account for a continuation of historically low in youth wages in the face of a declining supply of workers and declining unemployment (and some such efforts have already been made, e.g. Foot and Li, 1988). So long as youth cohorts were expanding, the demographic accounts provided a plausible interpretation of observed trends but this is not the same as providing direct evidence that demography was actually the primary cause of these trends, particularly over a period when so many other important changes were taking place in the economy.

Of course, the potential of either the supply-side or demand-side perspective to provide an adequate account of changes in wage distributions has not been exhausted. Kuttner, for example, includes not only industrial restructuring but also social and fiscal policies (e.g. privatization, declining real minimum wages), the impact of international competition, and a weakened labour movement among the elements affecting wage trends. Bluestone and Harrison (1988) also point to the institution of two-tier wage structures in some industries, the growing practice of "contracting out" to achieve lower labour costs, slow productivity growth, and the shift of investment from directly productive to speculative investment. Our own analyses now under way show a significant decline in the percentage of unionized jobs held by young workers (from 27% in 1981 to 18% in 1986) that was quite independent of the shift to industries with low levels of unionization. The percentage of unionized jobs held by young workers fell from 52% to 30% in resource-based industries, from 35% to 28% in other manufacturing, from 26% to 15% in construction, from 49% to 40% in the social services and so forth. Shifts such as a lower percentage of unionized jobs and possibly more job creation in smaller firms are indicators of significant change in the organization of the youth labour market within industries. This supports the notion that significant changes are occurring within industries which are influencing wage levels.

But similarly, just as it may take some time for relative wages to recover from the drop in demand associated with the recession and, in some provinces, slow recovery, "supply-side" theorists point out that it will take some time before the passage of the "baby boom" is felt and youth wages begin to rise again in the face of declining supply (Foot and Li, 1988). In this case, the changes we have observed here may be only temporary. It could also be that a combination of "generational crowding" and recession provided the occasion or impetus for a reorganization of the labour market which may prove to be relatively permanent. Youths' expectations regarding wages may be affected by a few years of lower relative wages, and employers starting to hire once again may find they can do so at lower wages. As well, as organizations attempt to keep costs low as a result of lessons learned during the recession, this could have a significant effect on the number and type of jobs in which the hiring of youth takes place. At this point, all of these interpretations are speculative. We have shown that there are significant changes in the wage distribution taking place which require further study. It may be necessary to await data from later in the recovery, perhaps 1988 or even 1989, to get a more definitive picture of both overall changes in the wage distribution and the ongoing change in wage rate among the young.

Whatever the reasons, it is clear that youth unemployment rates rose to high levels during the recession and have returned to pre-recession levels, and wages among the young have displayed remarkable "flexibility", and dropped dramatically during the 1980s. The expansion of low-wage jobs in Canada has been concentrated among the youth and young adults.

For older workers, the "declining middle" (or more accurately lower middle) of Canada's wage distribution over the 1981-86 period has largely meant movement into jobs with higher wage rates, although the relative <u>earnings</u> of middle aged and older workers have risen relatively little over the period studied. Middle aged and older workers seem to have consolidated their middle class standing over the period.

For the young, Canada's "declining middle" may mean delayed entry to the "middle class" standard of living for many of them, if their wages catch-up as they age. But it is impossible to predict the future course of wages and earnings.

The impact of the youth wage and unemployment patterns is not restricted to the labour market, but is felt in other parts of society. Recent changes in

the behaviour of young people regarding school attendance, living arrangements and family formation may well be associated with wage and employment trends.

Participation rates in Canada's colleges and universities rose during the 1980s - from about 20%[43] in 1980 to 25% in 1986 - as young people turned to education to get an edge in a very difficult labour market. And there has been an increase over the 1981-86 period in the tendency for young people to continue living with parents[44] (Boyd and Prior, 1988), possibly many out of financial necessity as they remain in school or earn low wages. Labour market conditions, notably lower individual earnings, can influence family formation, lifestyle and working patterns among young couples. To better understand what has been happening to wage distribution, it is necessary to both extend this analysis backwards into the 1970's using Census data, and to update it as more recent data from the Labour Market Activity Survey become available.

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(43) *Post-secondary enrolment as a percent of the 18-24 age group population.*

(44) *The proportion of 20-24 year-old males living with parents rose from 49% to 56% between 1981 and 1986, females 32% to 40%.*

APPENDIX I

OTHER DATA SOURCES AND ALTERNATE DISTRIBUTIONS

Throughout this study the wage rate has been the sole measure of compensation and the basis upon which all distributions were calculated. The 1981 Survey of Work History and the 1986 Labour Market Activity Survey were constructed in such a way that the work in any paid job could be broken down into equivalent hourly units with comparable rates of pay. This provided a rare opportunity to look at 'pure' distributions of wages weighted solely by number of hours worked at each wage rate. This approach differs from most previous studies that have associated changes in the distribution of earnings with industrial or occupational shifts.

Wage data, however, can be rolled up into earnings data yielding a metric for comparison between the Survey of Work History (SWH) / Labour Market Activity (LMAS) data and earnings distributions from other sources. The recent release of 1986 Census data provided the opportunity to match our constructed earnings distributions against another database with a similar time frame. Considering the differences between the data sources, the similarity in trends reported in the first part of this section were very reassuring.

While the earnings distributions from the two sources proved quite similar, it was obvious that they told a different story than the wage distribution. How could the wage and earnings distributions from the same source sketch different trends? The second part of this section highlights differences in the wage and earnings distributions from the SWH/LMAS and suggests that hours of work account for the differences between the two. In the process, some strengths of the wage approach and some pitfalls associated with presenting distributions at a highly aggregated level are highlighted.

1. Comparison of SWH/LMAS and Census Earnings Distributions

Yearly or weekly earnings rather than wages are the most frequent measures underlying the reported distributions. This choice has been dictated by the available data. The Survey of Consumer Finance (Canada), the Current Population Survey (U.S.) and censuses (Canada and U.S.) are the sources of earnings distributions cited most often in the literature. Each collects

very similar data on earnings, occupation and industry. Each also has some serious limitations for the analyst attempting to relate distributions of compensation to job characteristics.

Canadian earnings data usually refer to the total wage and salary income, self-employment income and farm income from all the jobs held during a calendar year.(45) Data collection is carried out between March and June the following year, depending on the survey. Wages and salaries constitute by far the largest component of earnings across the population--accounting for 92% of the total in the 1986 Census. Considering only paid workers, the wage and salary proportion rises to almost 99%. Wage and salary earnings (referred to simply as earnings for the rest of this section) thus provide a good indicator of most individuals' (or families') work-related earnings over a year.

Problems arise, however, when a link between earnings and the type or quantity of work used to achieve those earnings is sought. Job-related variables in these datasets usually refer to either the main job held in the week prior to the survey (ie. not the same period that the earnings data refer to) or the main job in the previous calendar year (regardless of the number of jobs held in that year). Therefore the connection between earnings data and industry, occupation or class of worker is tenuous. Similarly, hours of work and the number of weeks worked during the year are the respondent's combined estimate for all jobs. In an attempt to hold the amount of work constant, many researchers restrict their studies to full-time (greater than 30 hours per week(46)), full-year (49-52 weeks) workers. Unfortunately, this eliminates about half the labour force. Furthermore, many of the target groups of interest to researchers and policy-makers (eg. women, youth and marginal workers) are concentrated in the discarded records.

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(45) *Several U.S. studies use the Current Population Survey's usual weekly earnings measure. While reference week earnings may be more reliably linked to the industry and occupation data, it too presents some problems for multiple job holders, those who change jobs during a year and extrapolating yearly earnings (or utility) from a snapshot of a single week.*

(46) *In the U.S., 35 hours per week is the customary cutoff point for defining full-time jobs.*

In order to draw comparisons with other data sources, SWH/LMAS job-level wage data must be transformed into person-level earnings data. This transformation involves multiplying the wage rate by the total hours worked in each job and summing across jobs to calculate yearly earnings for individuals (or families, if so desired). While the direct link of wages to job characteristics is lost, the resultant earnings distribution are comparable to a number of other sources.

The Censuses of 1981 and 1986 provided the closest time frame to the SWH and LMAS at the time of writing. Wage and salary earnings distributions for full-time paid workers were calculated from both data sources with the survey weights adjusted by the number of weeks worked during the year. The earnings distributions were summarized by the ten-level, fixed-boundary method used in the main body of the report.(47) The procedure was repeated limiting the population to those who worked full-time, full-year, as has been the practice in some other studies.

Changes in earnings distributions have been shown to be sensitive to the years chosen as start and end points due to the juxtaposition of the business cycle. The Census earnings data cover the years 1980 and 1985 as opposed to the 1981 and 1986 coverage of the SWH/LMAS. While the time frames are a year out of synch, the dominant pattern of severe recession followed by sustained recovery is common to both data sources.

Results

All of the earnings distributions offered some evidence of a 'declining middle' trend from the early 1980s to the middle 1980s. The measured percentage point drop in the middle (defined as earnings levels 4-7) ranged from 1.28 to 3.69. The magnitude and direction of the shift varied by data source, the population selected and the definition of earnings. However, the Census data consistently yielded more positive shifts than the SWH/LMAS data.

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(47) *Mean, rather than median, earnings were used to inflate the boundaries. Calculating medians from the entire 1986 Census database would have involved considerable expense, a mean inflator was required for consistency across the comparisons presented in this section. Another departure from the main body of the report is the aggregation into three earnings groups (low, middle and high), opening some opportunity for comparison with other studies that use these designations.*

Table I-1 compares the change in earnings distributions from the Censuses to those from the SWH and LMAS for full-year equivalent, full-time workers (i.e. full-time workers weighted by the number of weeks worked). Both the detailed levels and a three level summary offer evidence of a shift away from the middle of the earnings distribution. The proportion of earners in the middle[48] shrank by at least 3.6 percentage points according to both sources. The SWH/LMAS shows about two-thirds of the net change moving into the bottom end, while the Census displays a more even split between the bottom and top. At the more detailed wage level the net movement in the SWH/LMAS is concentrated in the extreme (ie. first and tenth) categories, but was more spread out in the census distributions -- swelling the first, second ninth and tenth levels.

The full-time, full-year paid workers experienced more of an upward shift (see Table I-2). Again there is a substantial shift away from the middle logged by both sources with the Census displaying a stronger move towards the top. Indeed the three-level Census breakdown indicates a net shift out of both the bottom and middle into the upper portion of the distribution. However, this masks the significant growth at the extreme bottom evident in the more detailed distribution. Similarly, the lowest category ballooned by 4 percentage points in the SWH/LMAS, an enormous shift that would have been partially hidden at the higher level of aggregation. As might be expected, the more restricted population definition resulted in a greater concordance between the two data sources -- average absolute difference of .68 in Table I-2 compared to .91 in Table I-1.

Both the Census and SWH/LMAS offer some evidence of a declining middle among full-time paid workers (earnings levels 4-7), while differing somewhat on the direction of the shift. The divergence in trends that does exist may be due to actual differences in the reference periods or to differing rates of measurement error between the data sources. An exact determination is not possible without a consistent data source for all four years.

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(48) The middle consists of earnings levels 4-7; the lower end, levels 1-3; and the top, 8-10.

11. A Comparison of SWH/LMAS Earnings and Wage Distributions

Readers with an eye for detail will undoubtedly have noticed that the SWH/LMAS earnings distribution in the previous section tell a somewhat different story than the wage distributions reported elsewhere in this paper. This section examines how the calculation of wage distributions differs from earnings distributions from the same data source. The varying methods of calculation point to appropriate interpretations of each distribution and the strength of a dataset from which both can be calculated.

The first important distinction is between jobs and people. The wage distributions reported in the main body of the paper referred to jobs. Each job is weighted to a full-time equivalence according to the number of hours worked. The total refers to full-year, full-time jobs which may be thought of as equivalent labour units.

Earnings, on the other hand, are reported for individual respondents (percentages are calculated from the total number of paid workers). Since many people hold more than one job in a year, either consecutively or concurrently, job-based earnings (wage rate times hours worked) must be summed across jobs to arrive at person-based earnings. In the process the direct link to job characteristics is lost, but a better measurement of economic welfare is achieved.

The job-based wage distribution and the person-based earnings distribution (all paid workers) are contrasted in Table I-3. The most obvious feature of the wage distribution is the large increase in the lowest category. Significant growth also occurred at the seventh level. The higher level of aggregation (low, middle and high) disguises these features as wage groups 2-6 declined. The top wage group dropped more sharply than any other category. That decline was offset somewhat by growth at the ninth level when the top three groups are combined.

The earnings distribution shares an aggregate downward shift with the wage distribution but the magnitude of the shift and trends at the detailed level are quite different. Whereas the tenth wage level shrank, the tenth earnings level grew by 1.2 percentage points. In the aggregate, however, the 'top' declined due dramatic losses at the eighth earnings level. In the middle of the earnings distribution, losses at the fifth and seven

levels overshadowed some growth at the fourth and sixth levels to lend some support to the 'declining middle' thesis (in contrast to the wage distribution, where the 'middle' grew slightly). The shift to the 'bottom' was shared by the first three earnings levels, not concentrated in the first level, as was the case for the wage distribution.

The divergent trends traced by the wage and earnings distributions point to hours of work as an important intervening factor. Earnings (in its simplest form) is the product of two vectors: wages and hours. If trends in earnings and hours diverge, it is due to the interaction of hours.(49) Some preliminary work on resolving the two distributions (not presented here) has shown the relationship between hours and wages to be quite volatile.

These changes in the relationship between earnings, wages and hours can simply not be detected in the type of yearly earnings data most frequently cited in the declining middle literature. The dynamic nature of the labour market is evident not only in the changing distribution of wages (compensation for units of labour), but also in the way individuals transform their wages into earnings through the number of hours they work or, indeed, the number of jobs they hold.

Discussion

The first part of this section started out as an exercise in data validation. SWH/LMAS wage and hour data were transformed into earnings distributions. These distributions demonstrated similar trends to Census earnings distributions, even though the time frames were slightly out of synch. The second part of the section contrasted the wage and earnings distributions from the SWH/LMAS. The relationship between these distributions was demonstrated to be highly volatile over relatively short periods of time. These straightforward observations have some important corollaries for the general examination of inequality.

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(49) *The differences between distributions are intensified by the break-up of plateaus (where many respondents report the same wages or earnings) and the creation of new ones as the basis of the distribution is transformed.*

To begin, limiting the population under study to full-time, full-year workers or even week-weighted full-time workers yielded quite different results from the total paid work force --whether that work force is defined by jobs or individuals. Furthermore, the proportion of the labour force that works full-time throughout the year currently accounts for less than half of the workforce and varies over even very short periods of time. Although SWH/LMAS data can be manipulated to replicate this type of study, divergent trends among those who work less than full time or full year (including most members of low income groups) are ignored.

Even if the entire population is used, there remains the tenuous link between earnings data and job characteristics. Thus earnings changes attributed to shifts in industry and occupation may well be an artifact of trends in hours worked or some other bias associated with the research design. This is not to belittle the value of earnings distributions. The fact that the earnings and wage distributions differ by so much speaks of a place for each. Both fit into a series of distributions that describe differential societal rewards.

The wage distributions reported in this paper describe the varying rates of compensation (excluding non-wage benefits) for equivalent units of work and can be associated directly with the job characteristics such as industry, occupation, tenure and firm size. Wages and the number of hours worked across all jobs roll up into an individual's yearly earnings. Earnings distributions describe differing rewards to the year's work effort and can be related to individual characteristics (eg. sex, age, education, work experience) or economic conditions. Earnings is the largest component of total income, which also consists of investment earnings and transfer payments. Income distributions highlight the range of total economic welfare for each person over the course of a year. Both earnings and income are commonly summed across consuming units (i.e. census or economic families) for a more comprehensive look at the distribution of rewards from a single period. Over the long run, some proportion of each unit's income is accumulated as wealth. Periodic snapshots of the distribution of wealth provide another means of gauging differing rewards over the long run.

Though all are related, each of the distributions measure different concepts of economic welfare. The SWH/LMAS offered a unique opportunity to not only compare results across data sources, but also across concepts of reward. The divergent conclusions from the wage and earnings measures point to the

necessity of clearly defining the source of a distribution and which variables affect it.

Finally, the collapsing of wage and earnings distributions into highly aggregated categories (i.e. low, middle and high) consistently masked underlying trends. The growth in the number of hours worked at the lowest wage level or the climbing number of workers in the top earnings category are two examples of important phenomena which might be glossed over. Furthermore, the changes reported at this level are often sensitive to slight differences in the definition of aggregate boundaries. Wage and earnings distributions are characterized by plateaus -- many respondents reporting the same wages or earnings. Inflating or deflating boundaries to provide constant dollar measurements often pushes plateaus across the boundaries, skewing the results. Accordingly, sensitivity tests -- altering boundaries and inflators/deflators -- should be an integral part of inequality studies.

TABLE I-1: Comparison of Census and SWH/LMAS Earnings Distributions, All Full-time Paid Workers

Census Earnings Distributions, Full-time Workers, Weighted by Weeks Worked, Mean Inflator

Category	1980 %	1985 %	Change %	Change %
1	10.0	11.2	1.2	Bottom 3
2	10.2	11.5	1.3	1.9
3	9.9	9.2	-0.6	
4	10.0	8.7	-1.3	Middle 4
5	10.0	10.1	0.1	-3.6
6	10.3	8.6	-1.7	
7	9.7	9.0	-0.8	
8	10.8	10.7	-0.1	Top 3
9	9.2	10.1	0.9	1.7
10	10.0	10.9	0.9	

SWH/LMAS Earnings Distributions, Full-time Workers, Weighted by Weeks Worked, Mean Inflator

Category	1981 %	1986 %	Change %	Change %
1	9.9	12.0	2.1	Bottom 3
2	10.1	10.7	0.6	2.8
3	10.0	10.1	0.1	
4	10.0	8.3	-1.7	Middle 4
5	10.0	8.9	-1.1	-3.7
6	10.0	10.0	0.0	
7	9.9	8.9	-0.9	
8	10.1	10.7	0.6	Top 3
9	10.0	8.8	-1.1	0.9
10	10.0	11.5	1.4	

Average Absolute Difference*
Wage/Earnings
0.91

$$* \; D = \sum_{i=1}^{10} \left| \left(P_{s1986_i} - P_{s1981_i}\right) - \left(P_{c1985_i} - P_{c1980_i}\right) \right|$$

where D = average absolute difference
Ps = percentage in SWH/LMAS earnings category i
Pc = percentage in Census wage category i

TABLE I-2: Comparison of Census and SWH/LMAS Earnings Distributions, All Full-time, Full-year Paid Workers

Census Earnings Distributions, Full-time, Full-year Workers, Mean Inflator

Category	1980 %	1985 %	Change %	Change %
1	10.8	12.9	2.2	Bottom 3
2	9.3	8.0	-1.3	-0.4
3	10.0	8.7	-1.3	
4	10.2	8.8	-1.4	Middle 4
5	9.8	10.8	1.0	-2.5
6	10.0	9.5	-0.5	
7	11.3	9.7	-1.6	
8	9.5	8.2	-1.3	Top 3
9	9.6	11.6	2.0	2.9
10	9.6	11.7	2.2	

SWH/LMAS Earnings Distributions, Full-time, Full-year Worked, Mean Inflator

Category	1981 %	1986 %	Change %	Change %
1	9.3	13.2	4.0	Bottom 3
2	10.7	10.1	-0.6	1.7
3	10.0	8.4	-1.6	
4	9.3	8.0	-1.4	Middle 4
5	10.7	10.9	0.3	-3.6
6	10.0	9.5	-0.5	
7	10.0	8.0	-2.0	
8	10.0	9.3	-0.7	Top 3
9	9.8	9.9	0.0	1.8
10	10.2	12.6	2.5	

Average Absolute Difference*
Wage/Earnings
0.68

$$* \; D = \sum_{i=1}^{10} \left| \left(P_{s1986_i} - P_{s1981_i}\right) - \left(P_{c1985_i} - P_{c1980_i}\right) \right|$$

where D = average absolute difference
Ps = percentage in SWH/LMAS earnings category i
Pc = percentage in Census wage category i

TABLE I-3: Comparison of SWH/LMAS Wage and Earnings Distributions

Wage Distribution, All Paid Jobs

Category	1981 %	1986 %	Change %	Change %
1	9.8	12.6	2.8	Bottom 3
2	9.6	9.4	-0.2	0.6
3	10.5	8.5	-2.0	
4	10.1	10.1	0.0	Middle 4
5	10.1	9.6	-0.5	0.0
6	10.1	9.2	-0.9	
7	8.9	10.3	1.4	
8	10.9	10.7	-0.2	Top 3
9	10.9	11.3	0.4	-0.5
10	9.1	8.4	-0.7	

Earnings Distribution**, All Paid Workers

Category	1981 %	1986 %	Change %	Change %
1	10.0	10.8	0.8	Bottom 3
2	10.0	11.0	1.0	2.2
3	10.0	10.5	0.5	
4	9.9	10.0	0.1	Middle 4
5	10.1	8.4	-1.7	-1.6
6	10.0	10.4	0.4	
7	9.9	9.6	-0.3	
8	10.1	8.2	-1.9	Top 3
9	10.0	10.1	0.1	-0.6
10	10.0	11.2	1.2	

Average Absolute Difference*
Wage/Earnings
1.40

* $$D = \sum_{i=1}^{10} \left| (P_{s1986_i} - P_{s1981_i}) - (P_{c1985_i} - P_{c1980_i}) \right|$$

where D = average absolute difference
Ps = percentage in SWH/LMAS earnings category i
Pc = percentage in Census wage category i

** The wage distribution is based on wage rates in jobs, with the total representing the sum of all hours worked divided by 2120 (full-time, full-year equivalence). The earnings distribution totals to the actual number of paid workers and is based on the sum of wages times hours worked across all jobs held by an individual in the course of the year.

APPENDIX II

Statistical Tables

TABLE A-1 CHANGE IN THE WAGE DISTRIBUTION OF F.T.E. JOBS, BY AGE AND SEX, 1981-86

Hourly* Wage Level	16-24						25-34					
	1986			CHANGE IN SHARE 1981-86			1986			CHANGE IN SHARE 1981-86		
	Female	Male	Both	Female	Male	Both	Female	Male	Both	Female	Male	Both
1	39.6	26.1	32.3	19.8	12.7	16.0	12.5	5.4	8.3	2.5	0.7	1.6
2	20.1	18.1	19.0	0.0	5.3	3.0	10.0	6.3	7.8	-1.1	1.0	0.4
3	13.9	14.1	14.0	-4.6	-0.1	-2.1	10.5	7.7	8.9	-1.6	0.7	-0.1
4	10.0	14.2	12.3	-3.3	1.8	-0.5	13.0	10.1	11.3	1.9	1.9	2.0
5	6.2	8.4	7.4	-3.7	-3.0	-3.4	12.4	11.6	12.0	-0.2	1.8	1.0
6	4.3	7.2	5.8	-3.3	-2.7	-3.0	12.8	10.6	11.5	0.3	0.2	0.3
7	3.0	5.6	4.4	-1.5	-2.1	-1.8	10.1	13.2	11.9	1.6	2.8	2.2
8	1.9	3.8	2.9	-1.1	-5.2	-3.4	9.3	14.5	12.4	0.7	-1.0	-0.6
9	0.8	2.0	1.4	-1.3	-4.4	-3.1	6.7	14.1	11.1	-1.5	-3.1	-2.8
10	0.5	0.6	0.6	-0.9	-2.3	-1.7	2.6	6.5	4.9	-2.5	-4.9	-4.2
Total	100%	100%	100%				100%	100%	100%			

	35-49						50+					
1	11.6	3.9	6.9	0.7	-0.4	0.2	14.4	4.5	7.9	1.2	-2.2	-0.9
2	10.5	3.2	6.1	-0.4	-0.9	-0.6	13.1	4.9	7.7	-0.4	-1.9	-1.3
3	10.3	3.9	6.4	-3.2	-1.5	-2.0	10.8	3.3	5.9	-2.1	-4.3	-3.5
4	11.9	5.5	8.0	-0.8	-1.7	-1.2	13.6	7.6	9.6	1.5	-0.9	0.0
5	11.8	7.1	9.0	0.8	-1.4	-0.5	12.1	7.6	9.2	1.2	-1.8	-0.7
6	10.4	8.1	9.0	-0.6	-0.8	-0.6	10.6	9.1	9.6	-1.4	-2.1	-1.8
7	8.9	12.9	11.3	0.9	1.8	1.4	7.5	15.1	12.5	0.1	4.6	3.0
8	9.6	15.7	13.3	2.0	0.7	1.0	6.6	14.1	11.6	-0.9	0.3	-0.2
9	8.4	20.9	16.0	0.4	3.6	2.1	6.4	17.1	13.4	0.6	5.4	3.7
10	6.5	18.7	14.0	0.4	0.6	0.2	4.8	16.6	12.6	0.1	2.9	1.8
Total	100%	100%	100%				100%	100%	100%			

* See the methodology section for the details of how the hourly rate boundaries are calculated.
The boundaries are: for 1986 $5.24/hour, 6.76, 7.97, 9.22, 10.43, 11.87, 13.52, 15.58 and 19.41;
for 1981 $3.87/hour, 4.99, 5.89, 6.81, 7.71, 8.77, 9.99, 11.51 and 14.34.

TABLE A-2

Change in the Distribution of F.T.E. Jobs by Wage Level, Age and Education, 1981-1986

Hourly* Wage Level	Education					
	Less than Secondary		Completed Secondary		Completed Post-secondary	
	Wage Distribution in 1986	Change in Share 1981-86	Wage Distribution in 1986	Change in Share 1981-86	Wage Distribution in 1986	Change in Share 1981-86
1. Age 16-24						
1.	42.3	20.7	31.3	17.0	14.8	7.0
2.	18.5	0.3	20.4	5.1	15.5	3.8
3.	12.3	-4.3	14.5	-2.7	15.8	5.2
4.	10.0	-1.8	13.3	-0.4	13.6	1.2
5.	5.8	-2.9	6.8	-4.4	12.6	-2.4
6.	3.7	-4.2	5.7	-3.0	10.9	-1.5
7.	3.8	-1.3	3.9	-2.6	7.2	-1.4
8.	1.7	-3.1	2.7	-3.6	5.9	-4.4
9.	0.8	-2.8	1.3	-3.4	3.0	-3.4
10.	1.0	-0.5	0.2	-2.0	0.7	-4.0
2. Age 25-34						
1.	12.4	3.1	7.9	2.0	4.9	0.3
2.	10.1	-0.5	8.1	0.9	5.3	1.1
3.	10.4	-0.4	10.2	0.6	5.9	-0.2
4.	12.1	1.3	13.4	2.9	8.2	2.0
5.	12.9	2.4	12.5	-0.2	10.4	1.3
6.	11.2	-0.3	12.4	0.4	10.9	0.8
7.	10.6	1.1	11.1	1.1	14.1	4.6
8.	10.2	-1.6	12.1	-0.3	14.7	-0.1
9.	7.7	-2.0	9.5	-3.4	16.0	-3.5
10.	2.5	-3.1	2.7	-3.9	9.6	-6.1
3. Age 35-49						
1.	10.5	2.1	6.0	0.5	3.1	-1.5
2.	8.8	0.1	6.1	0.1	2.4	-0.5
3.	8.7	-1.8	7.0	-0.7	2.7	-1.9
4.	10.1	-0.8	9.0	-0.4	4.3	-1.2
5.	10.7	0.0	10.4	0.4	5.3	1.1
6.	9.5	-0.9	10.9	0.7	6.6	-1.0
7.	12.6	2.0	12.4	1.9	8.6	0.5
8.	12.6	0.2	13.4	0.5	14.1	2.8
9.	10.6	0.1	14.9	0.4	24.1	4.1
10.	5.9	-0.9	9.8	-3.3	28.8	-0.3

* See Table A-1 for description.

TABLE A-2 (cont'd)

Change in the Distribution of F.T.E. Jobs by Wage Level, Age and Education, 1981-1986 (Concl.)

Hourly* Wage Level	Education					
	Less than Secondary		Completed Secondary		Completed Post-secondary	
	Wage Distribution in 1986	Change in Share 1981-86	Wage Distribution in 1986	Change in Share 1981-86	Wage Distribution in 1986	Change in Share 1981-86
4. Age 50+						
1.	9.0	-0.5	7.7	0.1	5.3	-2.7
2.	8.8	-1.9	8.7	1.8	3.7	-1.7
3.	7.3	-3.5	5.7	-2.7	2.3	-3.1
4.	11.4	1.4	9.2	-1.8	5.7	-1.0
5.	10.0	-1.0	9.2	0.5	6.9	-0.5
6.	10.5	-1.8	10.8	-1.3	5.8	-1.4
7.	14.6	4.7	12.3	3.2	7.2	-1.5
8.	11.5	-0.6	12.4	-0.3	10.8	1.2
9.	11.4	3.7	12.8	1.3	19.3	4.7
10.	5.5	-0.5	11.0	-0.8	33.0	6.0

* See Table A-1 for description.

TABLE A-3
Net Change in Full-Time and Part-time F.T.E. Jobs by Wage Level, Canada, 1981-1986

Hourly Wage Level*	Net Change	Growth Rate	% 1986	Change 1981-86
A. Full-Time				
1.	198,613	29.3%	10.4	2.2
2.	11,604	1.6%	8.8	-0.1
3.	-139.137	-16.5%	8.4	-1.9
4.	7,133	0.9%	10.1	-0.1
5.	-36,726	-4.3%	9.8	-0.6
6.	-44,334	-5.2%	9.7	-0.8
7.	154,879	20.4%	10.9	1.6
8.	12,153	1.3%	11.3	-0.1
9.	62,587	6.6%	11.9	0.5
10.	-36,324	-4.7%	8.7	-0.7
Total	190,447	2.3%		
B. Part-Time				
1.	76,779	53.0%	33.4	7.4
2.	-2,474	-2.4%	14.6	-3.2
3.	-12,143	-16.4%	9.3	-4.0
4.	21,733	45.9%	10.4	1.9
5.	15,702	38.5%	8.5	1.2
6.	-8,315	-21.3%	4.6	-2.3
7.	8,562	35.2%	5.0	0.6
8.	4,163	15.4%	4.7	-0.1
9.	5,119	18.8%	4.9	0.0
10.	-3,657	-10.6%	4.6	-1.5
Total	105,469	18.9%		

* See Table A-1 for description.

TABLE A-4
Change in the Distribution of Full- and Part-time
F.T.E. Jobs by Wage Level, Age Group 16-24

Hourly Wage Level*	Full-time		Part-time	
	Wage Distribution 1986	Change 1981-86	Wage Distribution 1986	Change 1981-86
1.	27.5	13.5	60.0	19.9
2.	19.4	4.1	16.8	-5.7
3.	15.2	-1.3	7.0	-5.2
4.	13.2	-0.2	6.8	0.2
5.	8.1	-3.3	3.6	-1.1
6.	6.6	-2.8	1.5	-2.1
7.	4.8	-1.8	2.0	-0.8
8.	4.2	-3.5	1.1	-1.7
9.	1.6	-3.2	0.6	-1.2
10.	0.5	-1.6	0.7	-2.3

* See Table A-1 for description.

TABLE A-5
Definitions of Eight-Industry Sectors

	1980 SIC Codes
(1) Natural-Resource Based*	
Forestry	041-051
Fishing/trapping	031-033
Metal mines	061
Mineral fuels	063-071
Non-metal mines	062
Quarries and sand pits	081-082
Services to mining	091-092
Wood industries	251-259
Paper and allied	271-289
Primary metals	291-299
Petroleum and coal	361-369
Electric power, gas, water	491-499
(2) Manufacturing (excluding Natural-resource Based)	
Food and beverage	101-114
Tobacco products	121-122
Rubber and plastics	151-169
Leather	171
Textile	181-199
Knitting mills	N.A.
Clothing	243-249
Furniture and fixtures	261-269
Printing and publishing	281-284
Metal fabricating	301-309
Machinery	311-319
Transportation equip.	321-329
Electrical products	331-339
Non-metallic mineral prod.	351-359
Chemical and chemical products	371-379
Misc. manufacturing	391-399
(3) Construction	
General contractors	401-442
Special trade contractors	421-429
Services to construction	441-449
(4) Distributive Services	
Transportation	451-461
Storage	471-479
Communications	481-484
Wholesale trade	501-599
(5) Consumer Services	
Retail trade	601-692
Amusement and recreational services	961-969
Personal services	971-979
Accommodation and food	911-922
Miscellaneous services	982-999

TABLE A-5 (cont'd)
Definitions of Eight-Industry Sectors

	1980 SIC Codes
(6) Business Services	
Finance industries	701-729
Insurance carriers	731-733
Insurance/real estate	751-761
Services to business management	771-779
(7) Health/Education/Welfare	
Education and related	851-859
Health and welfare	861-869
Religious org.	981
(8) Public Administration	
Federal admin.	811-812
Provincial admin.	822
Local admin.	832
Other gov't	841

* The analysis is of the non-agricultural economy; hence, agriculture has been excluded.

The Goods-Producing Sector includes the natural resource-based industries, manufacturing and construction. The remainder are in the Services sector.

TABLE A-6
Changes in Full-time Equivalent Jobs in
Goods-Producing and Services Sector, 1981-86

Hourly Wage Level*	Wage Distribution in 1986	Change in Share 1981-86	Net Change in F.T.E. Jobs	Percent Distribution of Net Change
	(thousands)			
	Good-Producing Sector			
1.	6.3	0.9	9.8	-3.9
2.	7.9	0.4	-8.5	3.4
3.	8.2	-1.3	-59.2	23.7
4.	9.6	-0.4	-35.9	14.4
5.	9.6	-0.2	-29.8	12.0
6.	9.8	-0.8	-47.9	19.2
7.	12.3	2.4	39.2	-15.7
8.	14.0	-0.5	-48.7	19.5
9.	13.7	0.3	-24.1	9.7
10.	8.5	-0.8	-44.1	17.7
Total	100.0	0.0	-249.5	100.0
	Services Sector			
1.	14.5	3.2	265.6	48.7
2.	9.8	-0.6	17.6	3.2
3.	8.6	-2.4	-92.1	-16.9
4.	10.3	0.1	64.7	11.8
5.	9.7	-0.8	8.8	1.6
6.	9.1	-0.9	..	..
7.	9.7	1.2	124.2	22.8
8.	9.5	0.2	64.9	11.9
9.	10.3	0.6	91.9	16.8
10.	8.4	-0.7	..	..
Total	100.0	0.0	545.4	100.0

* See Table A-1 for description.

TABLE A-7

Detailed Industries Contributing A Change of More Than 10,000 Net Jobs* to a Wage Group, 1981-86

Industry	Net Job Growth or Decline (81-86) (thousands)
Very Low Wage Jobs (lowest level)	
Growth	
Retail Trade	107.7
Accommodation and Food	99.0
Personal Services	18.3
Miscellaneous Services	15.8
Amusement and Recreation Serv.	11.5
Decline	
Insurance and Real Estate Agents	-13.0
Below Average Wage Jobs (2nd, 3rd and 4th levels)	
Growth	
Miscellaneous Services	21.6
Amusement and Recreation Serv.	13.8
Decline	
Accommodation and Food Serv.	-34.1
Electrical Products	-19.4
General Contractors	-16.7
Communications	-14.1
Primary Metal	-11.1
Non-Metallic Mineral Prod.	-10.5
Middle Level Jobs (5th and 6th levels)	
Growth	
Health and Welfare	46.3
Wholesale Trade	14.6
Decline	
Retail Trade	-30.0
Transportation	-29.5
Communications	-17.9
Metal Fabricating	-13.2
Local Admin.	-11.3
Paper and Allied	-11.1

TABLE A-7 (cont'd)
Detailed Industries Contributing A Change of More Than 10,000 Net Jobs*
to a Wage Group, 1981-86

Industry	Net Job Growth or Decline (81-86) (thousands)
Above Average Wage Jobs (7th, 8th and 9th levels)	
Growth	
Education Services	61.8
Health and Welfare	57.3
Wholesale Trade	36.9
Communications	31.4
Transportation Equip.	25.9
Provincial Admin.	21.3
Transportation	20.8
Local Admin.	18.2
Food and Beverage Prod.	12.4
Accommodation and Food Serv.	10.8
Insurance Carriers	10.1
Decline	
Primary Metal	-18.6
Electrical Product	-18.5
Machinery Equip.	-14.7
General Contractors	-12.4
Very High Wage Jobs (10th level)	
Decline	
Special Trades Contractors	-17.3
General Contractors	-14.2
Retail Trade	-11.7

* Where the 10,000 contributes at least a 10% change in employment for that industry in the wage group.

TABLE A-8 CHANGE IN THE WAGE DISTRIBUTION OF F.T.E. JOBS, BY INDUSTRIAL SECTORS, 1981-86

Hourly Wage Levels 1986 Ranges	Natural Resource Based		Manufacturing		Construction		Distributive Services		Consumer Services	
	1986	Change 81-86	1986	Change 81-86	1986	Change 81-86	1986	Change 81-86	1986	Change 81-86
1 < $5.24	4.6	0.8	7.5	1.1	5.1	-0.2	5.9	0.1	32.9	10.7
2 5.25-6.76	4.0	-0.2	9.6	-0.1	8.0	2.3	6.6	-0.4	17.5	-1.3
3 6.77-7.97	4.4	-2.3	9.8	-1.8	8.6	1.7	8.5	-0.4	10.9	-4.4
4 7.98-9.22	6.7	-0.1	10.1	-1.4	12.1	1.8	9.1	-0.9	10.7	-0.1
5 9.23-10.43	6.9	-0.5	10.6	-0.6	10.7	1.0	9.8	-2.1	6.8	-1.6
6 10.44-11.87	7.6	-1.6	11.5	-0.4	7.4	-1.0	10.0	-2.2	5.6	-1.0
7 11.88-13.52	11.8	1.4	12.9	2.6	11.2	3.3	15.3	3.4	5.2	0.4
8 13.53-15.58	20.6	1.6	11.5	-0.6	12.1	-2.3	14.4	1.0	4.7	-0.9
9 15.59-19.41	21.5	2.2	9.3	0.0	16.9	-0.4	12.0	1.0	3.9	-0.2
10 > 19.41	11.9	-1.0	7.2	1.2	7.8	-6.2	8.4	0.5	2.0	-1.4
Total 1986 Full-time Jobs ('000)	708.9		1553.2		454.3		1151.6		1934.0	
Average Wage ($)	14.10		11.70		12.10		12.45		7.95	
Median Wage ($)	14.00		10.75		11.50		12.00		6.75	

	Business Services		Health/Education Welfare		Public Administration		Total	
	1986	Change 81-86	1986	Change 81-86	1986	Change 81-86	1986	Change 81-86
1 < $5.24	7.5	-1.6	7.4	0.2	4.7	-0.1	12.1	2.1
2 5.25-6.76	9.3	-1.4	6.2	0.1	3.4	-0.5	9.2	-0.2
3 6.77-7.97	11.8	-1.5	5.8	-2.8	4.7	-1.2	9.5	-2.0
4 7.98-9.22	14.0	1.9	10.3	0.5	6.9	-0.6	10.1	0.0
5 9.23-10.43	11.6	0.7	12.2	1.1	9.1	-1.8	9.6	-0.6
6 10.44-11.87	9.6	-0.5	10.3	-0.8	13.7	0.9	9.3	-0.9
7 11.88-13.52	8.6	1.5	10.0	0.6	12.9	1.5	10.5	1.6
8 13.53-15.58	6.4	-1.1	12.1	1.6	12.5	1.1	10.8	-0.2
9 15.59-19.41	9.7	0.8	13.8	1.1	17.7	1.6	11.4	0.4
10 > 19.41	11.3	1.2	11.7	-1.6	14.4	-0.9	8.5	-0.7
Total 1986 Full-time Jobs ('000)	922.7		1534.8		800.0			
Average Wage ($)	11.90		12.55		13.75			
Median Wage ($)	10.00		11.50		12.60			

TABLE A-9 1986 HOURLY WAGE RATES STATISTICS FOR 52 INDUSTRIES (F.T.E. JOBS)

SECTOR/INDUSTRY	NO. OF F.T.E. JOBS IN 1986	AVERAGE HOURLY WAGE	MEDIAN WAGE	WAGE DISTRIBUTION				
				<$6.75	$6.76-9.22	$9.23-11.87	$11.88-15.58	>$15.58
	('000)	($)	($)	Percent Distribution				
NATURAL RESOURCES:								
FORESTRY	59.4	12.30	11.98	14.5	13.2	21.9	26.5	23.9
FISHING/TRAPPING	22.7	7.78	6.66	50.7	18.5	16.6	7.9	6.3
METAL MINES	68.7	15.17	15.00	1.8	5.1	8.7	42.5	41.8
MINERAL FUELS	66.5	16.53	15.91	6.3	5.6	11.9	24.8	51.4
NON-METAL MINES	9.5	14.86	14.42	8.3	7.4	19.6	24.0	40.8
QUARRIES	7.0	10.42	10.00	5.8	43.4	21.4	26.4	3.0
MINING SERVICES	33.4	12.69	12.50	7.2	13.6	22.8	36.4	19.9
WOOD	105.1	12.25	11.25	11.8	22.5	17.6	27.7	20.4
PAPER/ALLIED	116.4	14.02	14.38	7.8	8.7	11.0	40.0	32.5
PRIMARY METAL	114.2	14.71	14.37	5.0	6.6	15.2	35.8	37.3
PETROLEUM/COAL	25.4	17.58	16.30	6.1	5.5	11.5	22.0	54.9
UTILITES	104.3	16.24	15.00	4.5	9.4	10.8	31.1	44.2
OTHER MANUFACTURING:								
FOOD/BEVERAGE	237.6	10.36	10.15	20.3	21.0	22.6	27.1	9.0
TOBACCO PRODUCTS	9.2	17.38	16.43	0.5	11.6	5.0	28.0	55.0
RUBBER/PLASTIC	84.0	11.55	10.62	11.2	22.7	27.3	21.7	17.0
LEATHER	31.7	8.97	7.67	37.6	34.6	11.0	8.1	8.7
TEXTILE	56.3	8.85	8.50	29.8	31.4	25.7	7.4	5.8
KNITTING/CLOTHING	103.1	8.13	6.90	48.3	25.4	13.9	5.3	7.1
FURNITURE/FIXTURES	55.8	9.22	8.00	30.1	33.1	20.9	10.3	5.6
PRINTING/PUBLISHING	137.8	11.92	10.71	19.9	16.9	22.6	18.0	22.6
METAL FABRICATIING	146.9	11.76	11.25	11.5	19.1	22.9	32.4	14.2
MACHINERY	74.7	12.33	11.62	15.3	16.2	19.5	31.4	17.6
TRANSPORT EQUIP.	235.3	13.65	13.00	5.8	12.1	20.8	40.8	20.6
ELECTRICAL PRODUCT	157.9	12.97	11.00	10.2	21.4	28.0	20.0	20.4
NON-METALLIC MINERAL	45.2	12.01	12.25	7.5	10.9	25.2	43.3	13.2
CHEMICAL PRODUCTS	92.6	14.03	11.98	9.8	17.6	22.4	19.7	30.5
MISC. MANUFACTURING	61.6	10.05	9.20	20.9	29.5	17.5	22.3	9.7
CONSTRUCTION:								
GENERAL CONTRACTORS	189.1	11.95	11.02	13.3	21.2	18.4	24.7	22.5
SPECIAL TRADES	256.2	12.20	11.50	13.1	20.8	17.1	22.3	26.8
SER. TO CONSTRUCTION	9.0	12.08	10.35	9.3	11.1	38.4	28.1	13.1
DISTRIBUTIVE SERVICES:								
TRANSPORTATION	442.1	12.54	12.05	11.9	15.1	19.1	35.4	18.3
STORAGE	16.6	12.26	10.12	7.6	36.2	18.0	15.2	22.9
COMMUNICATION	248.7	14.22	13.46	5.6	10.9	15.9	34.9	32.5
WHOLESALE TRADE	444.2	11.34	10.20	17.2	23.1	22.2	21.7	15.8

TABLE A-9 1986 HOURLY WAGE RATES STATISTICS FOR 52 INDUSTRIES (F.T.E. JOBS) - CONCLUDED

SECTOR/INDUSTRY	NO. OF F.T.E. JOBS IN 1986	AVERAGE HOURLY WAGE	MEDIAN WAGE	WAGE DISTRIBUTION				
				<$6.75	$6.76-9.22	$9.23-11.87	$11.88-15.58	>$15.58
	('000)	($)	($)	Percent Distribution				
CONSUMER SERVICES:								
RETAIL TRADE	1045.9	8.57	7.42	43.3	23.4	13.7	13.3	6.3
AMUSEMENT/RECREATION	101.5	8.55	7.00	45.1	20.8	12.7	12.3	9.2
PERSONAL SERVICES	127.5	6.54	5.50	62.1	19.4	11.5	3.7	3.3
ACCOMODATION/FOOD	485.5	6.40	5.06	68.4	16.8	8.2	4.0	2.7
MISC. SERVICES	173.6	9.29	8.00	36.9	26.0	16.7	8.3	12.0
BUSINESS SERVICES:								
FINANCE	288.9	12.24	10.06	8.9	30.2	25.1	16.1	19.7
INSURANCE CARRIERS	103.0	13.41	11.42	10.2	21.4	21.4	20.7	26.1
INSURANCE/REAL ESTATE	155.0	10.15	8.90	26.9	26.6	19.3	12.9	14.3
SER. TO BUSINESS MGT	375.8	11.98	10.00	20.5	23.2	19.1	13.7	23.5
HEALTH/EDUCATION WELFARE:								
EDUCATION/RELATED	680.3	14.48	14.23	8.7	10.8	17.0	23.3	40.2
HEALTH/WELFARE	797.7	11.25	10.28	15.2	20.0	27.6	22.5	14.7
RELIGIOUS ORG.	56.8	7.68	6.93	49.3	23.6	14.5	7.7	4.9
PUBLIC ADMINISTRATION:								
FEDERAL ADMIN.	287.4	14.27	13.42	7.3	10.6	22.7	24.1	35.2
PROVINCIAL ADMIN.	281.1	13.55	12.22	7.7	11.6	26.7	24.1	29.9
LOCAL ADMIN.	230.8	13.43	12.60	9.6	12.8	18.1	28.3	31.2
OTHER GOVERNMENT	0.6	9.24	11.30	42.2	0.0	29.0	28.8	0.0
TOTAL ECONOMY				21.3	18.6	19.0	21.2	19.8

TABLE A-10
Industry-Based Decomposition of Change in the Wage Distribution, 1981-86
(FTE Jobs)

Hourly Wage Level	Total Change in Share of Wage Distribution	Change in Share Due To:		
		Change in Job Mix Among Inds.	Change in Wage Dist. Within Ind.	Interaction Similtaneous Change in Both
1.	2.7%	0.3	2.3	0.1
2.	-0.2	0.2	-0.4	0.0
3.	-2.0	0.1	-2.0	-0.1
4.	0.0	0.1	-0.1	0.0
5.	-0.6	0.0	-0.6	0.0
6.	-0.9	0.0	-0.9	0.0
7.	1.5	-0.1	1.7	-0.1
8.	-0.2	-0.3	0.1	0.0
9.	0.4	-0.3	0.7	0.0
10.	-0.7	-0.1	-0.6	0.0
Distribution of Total Change Across Factors*	100%	13%	84%	4%

* This measure is a rough indication of the average contribution (across all wage levels) of each component to the total change in the wage distribution.

All change in shares are incorporated in this calculation in terms of absolute values, where signs are ignored. Each of the three components' contribution to the total change in share is the weight average across all wage level of its contribution in each level. The weights are the absolute value of the total change in share in each decile.

It is calculated as follows: Let $P_{i,j}$ be the change in share due to component i (e.g. job mix among industries) in wage level j. Let $P_{T,j}$ be the total change in share in quasi-decile j. Then $\bar{p}_{i\cdot}$, the weighted average across all levels j of the change in share due to component i (ie., 13% for component 1) is

$$\bar{p}_{i\cdot} = \sum_{j=1}^{10} \frac{|P_{T,j}|}{\left|\sum_{j=1}^{10} P_{T,j}\right|} \cdot \frac{|P_{ij}|}{\sum_{i=1}^{3} |P_{ij}|}$$

The first term in the summation is the weight.

TABLE A-12
Definitions of the Occupational Classifications

Occupational Group	Occupation	1980 OCM
Managerial	Managerial, administration and related	111-117
Professional/Technical Occupations	Physical, life sciences; math, stats, systems analysis and related; architects and engineers; architecture and engineering related; social science and related; religion; teaching and related (all levels); medicine and health (health diagnosing and treating, nursing, therapy, medicine and health related); artistic and recreational	211-337
Clerical	stenographic and typing; bookkeeping, accounting-recording, office machines and EDP operators; material recording, distributing reception, inform., mail distribution, library, file, correspondence, etc., other clerical	411-419
Sales	Sales, commodities Sales, services and others	513-519
Services Occupations	protective services; food and beverage proportion, lodging and accommodation services; personal, apparel, furnishing services; other service occupations	611-619
Primary Occupations	farming, horticulture and agriculture*, logging; fishing, hunting, trapping; forestry and logging; mining, quarrying	711-771
Processing/Fabricating/Machining	processing occupations; metal shaping and forming occupations; metal products fabricating; electrical, textiles, furs, leather goods; wood products; rubber and plastics fabricating occupations; mechanics and repairmen;	821-858

TABLE A-12 (cont'd)
Definitions of the Occupational Classifications

Occupational Group	Occupation	1980 OCM
Construction Trades	excavating, trading, paving; electrical power, lighting, wire, communications equipment, erecting, installing, repairing; other construction trades;	871-879
Transportation Equipment Operators and Other	motor transportation operators; other transportation equipment operators; material handling; other crafts and equipment operators	917-955

* Outside the agriculture industry sector, since this sector was excluded from the analysis.

TABLE A-13
Net Change in the Number of F.T.E. Jobs, 1981-86,
by Occupation and Wage Level

Wage Level	Manag. Admin.	Prof./ Tech.	Clerical	Sales	Service	Primary	Processing Fabricating Related	Construction	Transp. Op. and Others
1.	22.6	16.7	33.6	63.2	124.4	..	17.5	..	13.7
2.	29.1	...	-20.5	..	10.7	..	..	..	..
3.	12.6	-7.8	-50.6	-16.7	-32.3	..	-43.2	..	..
4.	21.6	7.7	-23.3	17.1	26.8	6.3	-20.7	..	..
5.	..	10.7	-19.2	14.9	12.4	7.8	-30.3	..	-6.3
6.	38.9	..	-31.8	..	..	6.2	-32.9	-17.9	-12.7
7.	41.2	34.9	..	20.9	14.1	16.6	8.1	7.9	24.2
8.	22.6	46.6	-10.0	..	8.3	15.7	-25.1	-11.5	-25.6
9.	30.7	59.1	-23.0	18.1	9.7	13.8	-23.4	7.7	..
10.	73.6	-24.2	-6.7	6.6	-7.3	-6.2	-39.5	-28.9	..
Total	292.8	150.2	-153.8	125.4	167.2	65.1	-195.2	-62.9	-22.5

TABLE A-14 CHANGE IN THE WAGE DISTRIBUTION OF F.T.E. JOBS, BY OCCUPATION, 1981-86

HOURLY WAGE LEVEL*	MANAGERIAL		PROFESSIONAL/ TECHNICAL		CLERICAL		SALES		SERVICES	
	1986	CHANGE 81-86	1986	CHANGE 81-86	1986	CHANGE 81-86	1986	CHANGE 81-86	1986	CHANGE 81-86
1	5.5	0.7	6.1	0.5	11.6	3.0	23.3	5.8	33.5	7.7
2	5.5	1.3	4.2	-0.2	11.8	-0.1	13.7	-3.3	16.0	-1.8
3	6.3	-0.6	4.5	-1.0	13.4	-1.8	9.9	-4.9	8.9	-5.3
4	7.4	0.0	7.0	-0.2	14.6	-0.1	10.1	0.8	10.6	1.0
5	7.0	-2.2	8.4	-0.1	13.7	0.1	8.8	0.7	8.2	-0.1
6	9.5	1.1	8.9	-0.7	12.7	-0.7	6.3	-1.7	5.3	-1.0
7	9.8	1.3	10.8	1.3	10.0	0.8	8.4	1.8	4.9	0.7
8	11.0	-1.0	14.8	1.7	6.5	0.0	6.7	-0.5	4.4	0.1
9	15.4	-1.5	19.4	2.1	3.5	-1.0	7.1	1.6	5.5	0.1
10	22.6	0.8	16.0	-3.4	2.2	-0.2	5.6	-0.1	2.8	-1.3
Median Wage ($)	13.40		13.70		9.10		8.20		6.90	
Average Wage ($)	14.95		14.00		9.65		9.70		8.10	
Total 1986 Full-time Jobs ('000)	1266.9		1574.4		1541.1		714.6		1055.0	
	AGRICULTURE/ OTHER PRIMARY		PROCESS./FABRIC./ MACHINING		CONSTRUCTION		TRANSPORT EQUIP. AND OTHER			
1	10.5	-0.6	8.0	2.1	3.6	-0.4	9.8	2.0		
2	6.8	-2.0	10.0	0.9	5.5	1.3	8.9	0.2		
3	5.8	-2.8	9.2	-1.6	6.8	0.9	9.1	-0.2		
4	7.3	0.8	10.8	0.0	10.0	1.0	10.7	0.1		
5	8.9	0.0	9.9	-0.7	9.4	0.3	11.1	-0.5		
6	9.8	0.7	10.1	-0.9	8.8	-2.2	10.4	-1.3		
7	15.2	4.3	13.0	2.2	12.7	2.8	13.8	3.4		
8	15.8	2.8	14.8	0.2	15.0	-0.4	12.8	-2.9		
9	14.8	1.8	11.3	-0.1	20.1	0.9	9.4	-0.4		
10	5.0	-4.9	3.0	-2.2	8.1	-4.3	4.0	-0.4		
Median Wage ($)	12.60		10.80		12.50		10.50			
Average Wage ($)	12.45		11.10		12.75		11.15			
Total 1986 Full-time Jobs ('000)	266.7		1354.1		497.5		775.0			

* SEE TABLE A-1 FOR DESCRIPTION

TABLE A-15

Occupation-Based Decomposition of Change in the Wage Distribution, 1981-86

(F.T.E. Jobs)

Hourly Wage Level	Total Change in Share of Wage Distribution	Change in Share Due To:		
		Change in Job Mix Among Occns.	Change in Wage Dist. Within Occns.	Interaction Similtaneous Change in Both
1.	2.9%	0.3	2.5	0.1
2.	-0.2	0.0	-0.1	-0.1
3.	-2.0	-0.2	-1.8	0.0
4.	0.0	-0.3	0.3	0.0
5.	-0.6	-0.2	-0.4	0.0
6.	-0.9	-0.3	-0.7	0.1
7.	1.5	-0.2	1.7	0.0
8.	-0.1	-0.1	0.0	0.0
9.	0.3	0.2	0.1	0.0
10.	-0.8	0.6	-1.5	0.0
Percent Distribution of Total Change*	100%	19%	77%	4%

* See footnote on Table A-10 for description of how this is calculated.

TABLE A-16 PERCENT DISTRIBUTION OF FULL-TIME JOBS AMONG INDUSTRY SECTORS, BY AGE AND SEX, 1981-86

INDUSTRY SECTORS	16-24		25-34		35-49		50+	
	1986	CHANGE IN SHARE 81-86	1986	CHANGE IN SHARE 81-86	1986	CHANGE IN SHARE 81-86	1986	CHANGE IN SHARE 81-86
MALES	%		%		%		%	
NATURAL RESOURCES	8.4	-6.3	12.7	-1.3	12.2	-1.7	12.6	-2.8
MANUFACTURING	17.8	-5.2	20.3	0.2	20.5	-1.0	22.4	0.3
CONSTRUCTION	12.6	2.1	7.5	-0.5	6.4	-1.9	7.2	1.6
SUB-TOTAL: GOODS-PRODUCING	38.7	-9.4	40.5	-1.5	39.1	-4.6	42.2	-0.9
DISTRIBUTIVE SERVICES	12.3	-0.8	19.4	3.3	16.2	-0.1	16.4	1.1
CONSUMER SERVICES	34.5	10.3	17.2	2.0	12.0	0.5	9.4	-1.3
BUSINESS SERVICES	5.7	0.3	8.5	-0.3	7.9	1.2	8.0	1.0
SUB-TOTAL: COMMERCIAL SERVICES	52.5	9.8	45.1	5.1	36.1	1.7	33.8	0.8
HEALTH/EDUCATION/WELFARE	4.0	0.1	6.6	-1.7	13.1	2.2	11.9	-0.2
PUBLIC ADMINISTRATION	4.8	-0.5	7.7	-1.9	11.6	0.7	12.2	0.3
SUB-TOTAL: NON-COMM. SERVICES	8.8	-0.4	14.3	-3.6	24.7	2.9	24.0	0.1
SUB-TOTAL: ALL SERVICES	61.2	9.4	59.5	1.5	60.9	4.6	57.8	0.9
FEMALES								
NATURAL RESOURCES	2.5	-0.4	2.6	-0.1	2.8	0.3	2.6	0.9
MANUFACTURING	12.9	-2.9	13.8	-1.4	15.7	-3.0	15.1	-1.3
CONSTRUCTION	1.1	-0.5	1.2	-0.3	0.8	-0.3	1.2	-0.2
SUB-TOTAL: GOODS-PRODUCING	16.5	-3.9	17.6	-1.7	19.3	-3.0	18.9	-0.6
DISTRIBUTIVE SERVICES	6.2	-1.0	8.6	-0.4	7.7	0.0	6.1	-1.0
CONSUMER SERVICES	39.7	8.5	20.6	2.7	19.1	-0.8	20.9	-3.8
BUSINESS SERVICES	15.7	-2.8	18.4	1.7	12.4	-0.1	11.2	1.4
SUB-TOTAL: COMMERCIAL SERVICES	61.5	4.7	47.6	4.1	39.1	-1.0	38.2	-3.3
HEALTH/EDUCATION/WELFARE	15.9	1.8	24.5	-2.1	32.6	4.1	34.6	4.6
PUBLIC ADMINISTRATION	6.0	-2.6	10.3	-0.2	9.0	-0.2	8.3	-0.6
SUB-TOTAL: NON-COMM. SERVICES	21.9	-0.9	34.8	-2.3	41.6	4.0	42.9	4.0
SUB-TOTAL: ALL SERVICES	83.5	3.9	82.4	1.7	80.7	3.0	81.1	0.6
BOTH SEXES								
NATURAL RESOURCES	5.8	-3.8	8.8	-1.2	8.7	-1.2	9.4	-1.9
MANUFACTURING	15.6	-4.3	17.8	-0.6	18.8	-1.8	20.1	-0.3
CONSTRUCTION	7.5	0.9	5.0	-0.6	4.4	-1.5	5.4	1.0
SUB-TOTAL: GOODS-PRODUCING	28.9	-7.2	31.6	-2.4	31.9	-4.5	34.9	-1.2
DISTRIBUTIVE SERVICES	9.6	-1.0	15.2	1.7	13.1	-0.3	13.2	0.3
CONSUMER SERVICES	36.8	9.6	18.5	2.4	14.6	0.2	13.0	-1.8
BUSINESS SERVICES	10.1	-1.0	12.3	0.8	9.5	0.9	9.0	1.2
SUB-TOTAL: COMMERCIAL SERVICES	56.5	7.7	46.1	4.8	37.2	0.8	35.2	-0.4
HEALTH/EDUCATION/WELFARE	9.3	0.9	13.5	-1.2	20.2	3.3	19.0	1.5
PUBLIC ADMINISTRATION	5.3	-1.4	8.7	-1.2	10.6	0.4	11.0	0.0
SUB-TOTAL: NON-COMM. SERVICES	14.6	-0.5	22.3	-2.4	30.9	3.7	30.0	1.5
SUB-TOTAL: ALL SERVICES	71.1	7.2	68.4	2.4	68.1	4.5	65.1	1.2
INDEX OF DISSIMILARITY		11.5		4.9		4.8		4.0

TABLE A-17 PERCENT DISTRIBUTION OF FULL-TIME JOBS AMONG OCCUPATIONS, BY AGE AND SEX, 1981-86

OCCUPATIONS	16-24		25-34		35-49		50+	
	1986	CHANGE IN SHARE 81-86	1986	CHANGE IN SHARE 81-86	1986	CHANGE IN SHARE 81-86	1986	CHANGE IN SHARE 81-86
	%		%		%		%	
MALES								
MANAGERIAL	6.6	1.7	14.2	0.7	19.0	1.8	19.6	4.0
PROFESSIONAL/TECHNICAL	7.8	0.3	14.8	-2.3	17.3	2.6	11.2	-0.5
CLERICAL	7.4	-0.9	6.8	-1.0	5.7	-1.1	6.2	-2.2
SALES	10.4	3.7	8.1	1.8	6.3	0.3	7.3	0.9
SERVICES	13.3	4.5	6.9	0.8	7.9	1.0	10.9	0.6
AGRICULTURE	2.2	0.6	0.4	-0.1	0.3	-0.1	0.5	-0.5
PRIMARY	4.4	0.6	4.1	0.6	4.0	1.7	3.6	1.6
PROCESS/FABRIC/MACHINING	22.4	-6.9	21.5	-0.7	19.6	-3.3	19.0	-2.7
CONSTRUCTION	12.3	-0.9	9.0	-0.7	8.3	-1.6	9.2	0.0
OTHER	12.5	-1.9	14.0	1.1	11.5	-0.7	12.2	-0.1
FEMALES								
MANAGERIAL	8.7	3.6	14.7	4.3	14.2	5.1	13.1	3.6
PROFESSIONAL/TECHNICAL	15.1	1.8	23.8	-2.6	25.5	2.7	20.9	3.6
CLERICAL	36.8	-10.1	34.9	-3.0	30.8	-4.0	29.2	-6.8
SALES	9.3	2.9	6.4	1.1	6.1	0.2	7.3	0.2
SERVICES	18.6	4.4	9.8	0.8	11.3	0.0	16.4	0.0
AGRICULTURE	0.3	-0.2	0.2	0.0	0.1	-0.1	0.2	0.2
PRIMARY	0.5	0.2	0.4	0.3	0.3	0.1	0.8	0.7
PROCESS/FABRIC/MACHINING	7.4	-1.9	6.6	-1.3	9.6	-2.0	9.4	-0.4
CONSTRUCTION	0.2	-0.2	0.2	0.0	0.2	-0.1	0.2	0.1
OTHER	3.0	0.2	2.9	0.8	2.1	-1.2	2.4	-0.7
BOTH SEXES								
MANAGERIAL	7.5	2.6	14.4	2.0	17.3	2.8	17.6	3.8
PROFESSIONAL/TECHNICAL	11.0	1.0	18.3	-2.1	20.3	2.8	14.2	0.9
CLERICAL	20.4	-4.7	17.7	-0.8	14.8	-1.5	13.4	-3.2
SALES	9.9	3.3	7.4	1.5	6.2	0.2	7.3	0.7
SERVICES	15.6	4.5	8.0	0.9	9.1	0.7	12.7	0.5
AGRICULTURE	1.3	0.2	0.3	-0.1	0.2	-0.1	0.4	-0.3
PRIMARY	2.7	0.4	2.7	0.4	2.7	1.0	2.7	1.3
PROCESS/FABRIC/MACHINING	15.8	-4.8	15.7	-1.4	16.0	-3.1	16.0	-2.2
CONSTRUCTION	7.0	-0.7	5.6	-0.8	5.3	-1.3	6.4	-0.1
OTHER	8.3	-1.0	9.7	0.6	8.1	-1.1	9.1	-0.4
INDEX OF DISSIMILARITY		11.6		5.3		7.3		6.7

TABLE A-18 CHANGE IN THE WAGE DISTRIBUTION OF FULL-TIME JOBS, BY INDUSTRY, AGE GROUP 16-24, 1981-86

HOURLY WAGE LEVEL*	NATURAL RESOURCES		MANUFACTURING		CONSTRUCTION		DISTRIBUTIVE SERVICES	
	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86
1	13.2	7.0	18.3	9.4	12.5	4.2	13.7	5.8
2	13.1	6.2	20.6	6.0	20.0	11.5	19.9	6.9
3	13.1	1.2	18.9	0.6	15.8	3.4	17.5	-0.2
4	13.4	4.6	12.2	-2.2	19.8	5.6	14.9	0.5
5	11.9	2.2	9.3	-2.4	11.1	-2.6	10.9	-0.8
6	9.6	0.3	9.8	-1.9	4.7	-5.3	7.9	-4.6
7	9.4	-0.7	6.4	-2.2	8.3	0.2	6.8	-3.3
8	12.1	-6.8	2.8	-3.9	4.2	-6.7	4.2	-2.8
9	3.0	-11.5	1.7	-1.7	2.4	-6.0	4.1	0.0
10	1.3	-2.5	0.0	-1.7	1.3	-4.2	0.2	-1.5
	CONSUMER SERVICES		BUSINESS SERVICES		HEALTH/EDUCATION WELFARE		PUBLIC ADMINISTRATION	
1	47.7	19.7	11.4	1.7	19.2	8.0	21.5	12.6
2	21.0	-3.0	20.4	5.4	17.5	6.9	10.5	1.1
3	11.6	-4.7	25.3	2.5	12.3	-2.9	12.6	0.6
4	8.9	-2.4	22.7	3.8	12.0	-2.2	17.6	4.2
5	3.9	-3.5	9.3	-3.3	11.4	-3.6	11.8	-7.5
6	3.2	-0.9	5.7	-4.1	11.7	-0.7	11.2	-4.0
7	1.5	-1.1	3.2	-0.5	8.2	0.4	6.9	-1.6
8	1.1	-1.5	1.0	-1.9	6.7	-0.3	3.7	-2.2
9	0.7	-1.4	0.3	-2.8	0.5	-4.0	3.7	-2.1
10	0.5	-1.2	0.7	-0.7	0.6	-1.6	0.6	-1.2

* SEE TABLE A-1 FOR DESCRIPTION

TABLE A-19 CHANGE IN THE WAGE DISTRIBUTION OF FULL-TIME JOBS, BY OCCUPATION, AGE GROUP 16-24, 1981-86

HOURLY WAGE LEVEL*	MANAGERIAL		PROFESSIONAL/TECHNICAL		CLERICAL		SALES	
	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86
1	13.6	5.1	20.7	9.5	23.9	13.8	43.7	22.5
2	17.6	5.2	11.3	2.0	23.2	5.4	21.0	-1.0
3	17.1	1.2	11.4	2.0	23.0	1.1	14.4	-3.6
4	18.5	2.8	12.9	0.5	14.0	-4.2	9.0	-1.8
5	11.3	-3.4	9.2	-2.9	8.1	-5.0	4.8	-3.2
6	10.7	-2.1	13.3	0.8	4.4	-5.1	3.1	-3.2
7	6.4	0.6	9.7	1.1	1.6	-3.3	2.1	-3.6
8	1.7	-3.4	7.4	-3.7	1.0	-1.2	1.1	-2.6
9	2.3	-3.2	3.1	-5.3	0.5	-1.2	0.8	-1.4
10	1.4	-2.9	1.0	-3.9	0.2	-0.3	0.1	-2.1
	PRIMARY		PROCESS./FABRIC.		CONSTRUCTION		OTHER	
1	23.6	13.7	18.2	9.3	10.0	2.7	21.2	9.3
2	11.3	4.1	20.3	6.9	17.3	9.9	20.7	6.1
3	6.2	-1.8	15.9	-1.6	16.1	4.9	13.2	-1.2
4	11.7	7.7	15.0	1.1	19.2	6.2	16.3	4.6
5	9.9	2.9	8.7	-2.5	13.3	0.9	9.9	-3.4
6	9.1	-6.8	9.2	0.2	5.9	-7.2	5.1	-5.2
7	13.5	0.5	6.4	-2.6	9.3	-1.1	5.7	0.7
8	8.9	-7.5	5.2	-3.8	4.3	-6.9	4.4	-7.5
9	4.2	-8.8	1.1	-5.1	3.1	-6.9	3.3	-1.8
10	1.8	-4.0	0.0	-2.0	1.4	-2.6	0.3	-1.6

* SEE TABLE A-1 FOR DESCRIPTION

TABLE A-20 CHANGE IN THE WAGE DISTRIBUTION OF F.T.E. JOBS, BY INDUSTRY, AGE GROUP 25-34, 1981-86

HOURLY WAGE LEVEL*	NATURAL RESOURCES		MANUFACTURING		CONSTRUCTION		DISTRIBUTIVE SERVICES	
	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86
1	3.3	0.8	6.4	1.7	2.8	0.4	4.2	-0.2
2	3.6	0.6	8.1	0.3	5.1	-0.9	6.2	-0.5
3	3.4	-0.9	9.9	-0.5	9.8	4.0	9.9	2.5
4	6.9	0.7	11.9	1.5	9.5	0.8	10.1	0.3
5	7.6	0.9	13.5	1.3	13.5	4.6	11.7	-0.8
6	7.9	-2.5	12.7	-0.4	10.5	1.8	12.2	-0.2
7	11.1	1.8	13.5	3.0	15.1	7.3	14.5	3.5
8	23.5	3.0	11.5	-2.5	12.9	-2.8	14.0	-1.1
9	24.0	0.2	8.5	-2.3	15.0	-4.2	10.6	-2.2
10	8.7	-4.5	4.0	-2.1	5.8	-11.0	6.5	-1.2
	CONSUMER SERVICES		BUSINESS SERVICES		HEALTH/EDUCATION WELFARE		PUBLIC ADMINISTRATION	
1	21.7	5.5	4.9	-1.3	7.5	0.5	2.8	-0.7
2	15.7	-0.4	7.2	0.3	5.6	0.4	2.3	0.1
3	11.7	-3.4	10.9	0.6	6.2	-1.2	4.7	-0.1
4	13.9	2.2	15.6	5.2	10.0	1.6	7.4	2.1
5	9.6	-1.0	11.9	-1.3	15.5	6.3	12.1	-0.3
6	7.4	-0.8	14.0	3.7	11.9	-0.3	17.6	4.4
7	6.9	1.3	9.8	-0.3	13.1	2.6	15.7	2.9
8	6.4	-0.4	9.4	-0.1	14.7	0.5	14.1	2.2
9	5.0	-1.6	10.4	-2.3	11.9	-3.7	15.7	-3.8
10	1.7	-1.4	6.0	-4.5	3.8	-6.8	7.7	-6.7

* SEE TABLE A-1 FOR DESCRIPTION

TABLE A-21 CHANGE IN THE WAGE DISTRIBUTION OF F.T.E. JOBS, BY OCCUPATION, AGE GROUP 25-34, 1981-86

HOURLY WAGE LEVEL*	MANAGERIAL		PROFESSIONAL/TECHNICAL		CLERICAL		SALES	
	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86
1	4.1	1.2	5.2	0.5	5.7	0.4	12.5	-1.1
2	4.8	1.1	4.2	0.7	9.5	-0.9	12.1	-1.3
3	7.3	0.3	4.6	0.4	12.9	-1.3	10.8	-2.5
4	10.0	2.2	6.8	0.3	16.9	3.3	12.9	2.9
5	9.2	-2.3	11.1	2.8	16.5	0.0	12.7	2.0
6	12.5	3.1	11.1	-0.1	16.1	0.6	11.3	4.6
7	12.9	2.5	15.4	5.1	10.2	0.3	10.6	2.9
8	14.3	1.3	16.3	0.8	7.5	0.2	7.2	-2.2
9	14.3	-5.3	17.0	-2.5	3.0	-2.5	6.4	-1.8
10	10.7	-4.0	8.4	-7.9	1.8	0.1	3.5	-3.5
	PRIMARY		PROCESS./FABRIC.		CONSTRUCTION		OTHER	
1	7.3	-2.1	7.0	2.7	2.6	0.1	6.8	1.3
2	2.8	-1.6	9.7	2.6	2.7	-2.0	8.0	0.7
3	5.5	0.5	8.9	0.1	6.5	1.1	12.1	3.3
4	5.4	0.0	12.2	2.3	9.0	2.3	12.1	1.8
5	9.0	0.4	10.5	-0.1	11.3	3.3	14.6	4.0
6	11.4	3.5	10.2	-1.4	11.0	1.9	10.3	-3.4
7	14.2	3.2	12.1	1.0	15.6	6.4	11.1	1.3
8	18.6	1.3	15.3	-1.8	15.0	-2.0	13.5	-3.5
9	21.0	3.6	12.3	-1.8	20.8	-1.3	7.9	-4.4
10	4.9	-8.7	1.9	-3.5	5.7	-9.8	3.7	-1.1

* SEE TABLE A-1 FOR DESCRIPTION

TABLE A-22 CHANGE IN THE WAGE DISTRIBUTION OF F.T.E. JOBS, BY INDUSTRY, AGE GROUP 35-49, 1981-86

HOURLY WAGE LEVEL*	NATURAL RESOURCES		MANUFACTURING		CONSTRUCTION		DISTRIBUTIVE SERVICES	
	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86
1	3.2	-0.7	4.9	-0.6	3.3	-1.1	5.0	-0.4
2	1.7	-0.9	6.6	-1.4	4.8	1.0	3.9	-0.5
3	3.2	-3.1	7.6	-1.8	4.3	-0.9	5.8	-0.9
4	4.7	-2.4	8.6	-2.3	8.7	-0.8	6.0	-2.3
5	6.1	-0.4	9.8	-0.6	7.5	0.5	7.9	-3.5
6	6.2	-0.8	11.0	0.2	6.8	0.1	8.8	-1.8
7	11.9	-0.6	13.6	2.3	11.7	3.3	16.8	3.0
8	20.5	2.5	14.4	0.9	18.2	2.4	17.9	3.6
9	24.9	4.1	12.9	1.0	24.1	1.7	15.6	1.7
10	17.7	2.2	10.7	2.4	10.7	-6.2	12.3	1.1
	CONSUMER SERVICES		BUSINESS SERVICES		HEALTH/EDUCATION WELFARE		PUBLIC ADMINISTRATION	
1	22.2	6.2	5.9	-2.0	3.7	-0.8	2.1	-1.5
2	15.7	1.7	6.1	-3.3	3.9	-0.7	2.0	-0.2
3	11.2	-3.9	8.2	-2.9	4.7	-2.0	3.6	0.1
4	11.0	-1.2	9.7	-0.3	9.9	0.8	4.3	-1.8
5	8.1	-1.5	12.8	4.5	10.6	-0.7	6.3	-0.6
6	6.5	-2.1	7.5	-2.8	9.7	-0.6	12.9	2.4
7	7.4	1.1	9.6	2.6	9.1	0.4	12.1	1.0
8	7.6	-0.8	6.8	-1.1	12.8	2.7	13.6	0.2
9	6.8	2.3	12.8	2.1	18.7	2.9	22.2	2.2
10	3.6	-1.9	20.7	3.1	18.0	-2.1	21.1	-1.8

* SEE TABLE A-1 FOR DESCRIPTION

TABLE A-23 CHANGE IN THE WAGE DISTRIBUTION OF F.T.E. JOBS, BY OCCUPATION, AGE GROUP 35-49, 1981-86

HOURLY WAGE LEVEL*	MANAGERIAL		PROFESSIONAL/TECHNICAL		CLERICAL		SALES	
	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86
1	4.7	-0.4	2.8	-0.4	6.6	-0.8	13.5	0.3
2	3.9	1.7	2.2	-1.3	8.3	0.0	9.7	-3.9
3	4.2	-1.2	3.0	-1.6	10.9	-1.6	8.4	-5.8
4	4.0	-1.7	5.3	-0.4	13.6	-0.4	9.7	-0.8
5	6.1	-0.9	6.5	-0.5	15.1	2.8	8.8	1.0
6	7.4	0.4	6.5	-1.0	14.9	-0.1	5.0	-5.1
7	7.9	0.2	8.7	-0.1	13.1	2.0	11.3	3.5
8	11.4	0.1	15.5	3.6	8.9	-0.1	10.6	1.0
9	17.7	-1.4	25.5	5.4	5.4	-0.7	12.7	6.9
10	32.8	3.2	24.2	-3.8	3.3	-1.1	10.5	2.8
	PRIMARY		PROCESS./FABRIC.		CONSTRUCTION		OTHER	
1	3.0	-6.3	4.4	-0.8	2.2	0.1	8.8	2.7
2	3.3	-4.5	7.0	-0.2	2.7	0.7	6.1	0.1
3	3.0	-3.2	8.0	-0.8	3.5	0.3	5.3	-1.5
4	4.8	-1.4	9.0	-1.0	6.3	-1.9	7.3	-2.8
5	10.0	2.0	9.4	-1.0	6.7	-1.5	9.3	-2.3
6	10.0	3.6	9.7	-0.5	8.5	-0.4	12.1	1.8
7	17.1	2.6	15.5	3.4	13.5	2.7	16.9	2.8
8	18.9	6.0	18.4	2.7	21.3	4.9	14.6	-2.4
9	20.7	3.6	14.6	1.3	24.8	-1.4	14.4	2.6
10	9.3	-2.3	4.1	-3.1	10.6	-3.6	5.2	-0.9

* SEE TABLE A-1 FOR DESCRIPTION

TABLE A-24 CHANGE IN THE WAGE DISTRIBUTION OF F.T.E. JOBS, BY INDUSTRY, AGE GROUP 50 AND OVER, 1981-86

HOURLY WAGE LEVEL*	NATURAL RESOURCES		MANUFACTURING		CONSTRUCTION		DISTRIBUTIVE SERVICES	
	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86
1	4.3	1.3	4.6	-1.8	1.6	-5.8	4.4	-1.7
2	3.2	-1.9	9.1	-0.2	1.6	-2.2	3.4	-1.6
3	3.4	-2.8	6.9	-2.6	4.2	1.2	4.5	-2.8
4	6.1	0.6	8.6	-2.0	12.4	4.4	8.7	-0.1
5	4.3	-3.2	8.2	-2.2	10.6	0.5	8.8	-3.9
6	8.2	-2.4	12.2	-0.4	6.7	-2.3	9.1	-5.2
7	14.4	4.9	15.8	5.0	7.9	1.1	20.2	7.6
8	20.9	2.1	13.2	-0.5	11.3	-3.8	15.8	1.1
9	21.8	6.6	9.9	0.3	28.0	9.3	14.0	4.2
10	13.4	-5.3	11.4	4.4	15.6	-2.3	11.1	2.3
	CONSUMER SERVICES		BUSINESS SERVICES		HEALTH/EDUCATION WELFARE		PUBLIC ADMINISTRATION	
1	21.2	4.7	11.1	-5.8	7.7	-1.0	3.5	-1.6
2	18.4	0.2	9.4	-5.4	6.8	0.0	3.2	-1.4
3	10.7	-6.3	7.5	-0.8	4.6	-4.9	3.1	-3.3
4	11.4	1.3	10.6	0.6	12.3	0.2	6.1	-2.5
5	8.4	0.4	11.8	4.0	11.7	0.1	8.9	-0.4
6	8.3	0.1	8.0	-2.6	9.6	-1.3	11.4	-3.1
7	7.5	1.1	9.7	4.1	8.9	-1.1	13.5	2.0
8	5.4	-1.8	3.7	-5.7	10.6	2.7	12.5	0.6
9	4.8	0.8	11.4	5.5	12.9	3.5	19.3	6.0
10	3.9	-0.6	16.9	6.1	15.0	1.8	18.5	3.6

* SEE TABLE A-1 FOR DESCRIPTION

TABLE A-25 CHANGE IN THE WAGE DISTRIBUTION OF F.T.E. JOBS, BY OCCUPATION, AGE GROUP 50 AND OVER, 1981-86

HOURLY WAGE LEVEL*	MANAGERIAL		PROFESSIONAL/TECHNICAL		CLERICAL		SALES	
	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86	WAGE DISTRIBUTION 1986	CHANGE 81-86
1	5.6	0.1	5.4	-1.5	9.5	0.8	17.3	-0.2
2	4.6	-0.1	3.5	-0.4	8.8	-0.4	12.0	-5.8
3	4.1	-0.9	2.5	-4.4	8.5	-1.2	7.9	-8.7
4	5.7	-0.7	7.6	-0.1	13.4	0.0	9.4	3.3
5	4.0	-3.3	6.9	-2.6	13.4	0.9	9.9	2.8
6	8.8	1.5	7.4	0.2	13.6	-1.8	5.7	-5.0
7	10.0	2.2	7.2	-2.7	15.3	2.2	10.5	4.5
8	9.2	-5.9	15.5	4.0	7.7	-0.7	8.2	1.9
9	18.2	4.3	20.5	6.3	5.8	0.0	9.3	3.4
10	29.9	2.8	23.4	1.1	4.0	0.2	9.8	4.0
	PRIMARY		PROCESS./FABRIC.		CONSTRUCTION		OTHER	
1	4.8	-4.0	5.5	1.1	0.6	-3.9	3.1	-3.2
2	7.6	3.4	6.7	-2.3	1.7	-1.2	4.5	-2.5
3	6.7	-5.6	5.9	-2.8	2.8	-0.1	6.5	-2.0
4	7.3	1.2	8.1	-1.7	8.4	0.2	9.5	-0.9
5	4.5	0.9	11.3	0.7	7.1	-0.9	9.1	-2.3
6	5.9	-2.5	11.6	-2.3	9.1	-6.3	13.3	-0.2
7	20.2	10.0	16.2	5.4	10.5	1.5	21.7	9.8
8	23.7	10.4	16.0	-0.1	15.7	-1.3	16.6	-0.6
9	16.2	2.6	12.9	1.9	29.2	12.9	9.8	0.4
10	3.2	-16.2	5.8	0.2	15.0	-0.9	6.0	1.5

* SEE TABLE A-1 FOR DESCRIPTION

TABLE A-26 INDUSTRY-BASED DECOMPOSITION OF THE CHANGE IN THE WAGE DISTRIBUTION, AGE GROUP 16-24, 1981-86

(FULL-TIME JOBS ONLY)

HOURLY WAGE LEVEL	TOTAL CHANGE IN SHARE	CHANGE IN SHARE DUE TO:		
		CHANGE IN F.T. JOB MIX AMONG SECTORS	CHANGE IN WAGE DIST. WITHIN SECTORS	INTERACTION: SIMULTANEOUS CHANGE IN BOTH
1	13.5	2.0	10.5	1.1
2	4.1	1.2	3.7	-0.8
3	-1.3	0.0	-0.8	-0.5
4	-0.2	-0.1	0.3	-0.4
5	-3.3	-0.4	-2.7	-0.2
6	-2.8	-0.7	-2.2	0.1
7	-1.8	-0.6	-1.3	0.1
8	-3.5	-0.8	-3.0	0.3
9	-3.2	-0.5	-3.0	0.3
10	-1.6	0.0	-1.6	0.0
DISTRIBUTION OF TOTAL CHANGE ACROSS FACTORS* AGE GROUP				
16-24	100%	18%	70%	12%
25-34	100%	16%	78%	5%
35-49	100%	17%	80%	3%
50+	100%	6%	87%	6%

* See footnote in table A-10 for a description of this calculation.

TABLE A-27 OCCUPATIONAL-BASED DECOMPOSITION OF THE CHANGE IN THE WAGE DISTRIBUTION, AGE GROUP 16-24, 1981-86

(FULL-TIME JOBS ONLY)

HOULY WAGE LEVEL	TOTAL CHANGE IN SHARE	CHANGE IN SHARE DUE TO:		
		CHANGE IN F.T. JOB MIX AMONG OCCUP. GROUP	CHANGE IN WAGE DIST. WITHIN OCCUP. GROUP	INTERACTION: SIMULTANEOUS CHANGE IN BOTH
1	13.7	1.6	11.6	0.5
2	4.2	0.4	4.5	-0.7
3	-1.0	-0.3	-0.6	-0.4
4	-0.2	-0.5	0.3	0.1
5	-3.3	-0.4	-3.0	0.1
6	-2.9	-0.2	-2.8	0.1
7	-1.8	-0.2	-1.7	0.1
8	-3.5	-0.3	-3.3	0.1
9	-3.2	-0.1	-3.2	0.1
10	-1.6	0.1	-1.7	-0.1
DISTRIBUTION OF TOTAL CHANGE ACROSS FACTORS* AGE GROUP				
16-24	100%	15%	78%	7%
25-34	100%	10%	85%	4%
35-49	100%	23%	72%	6%
50+	100%	15%	80%	5%

* See footnote on table A-10 for a description of this calculation.

TABLE A-28 CHANGE IN THE WAGE DISTRIBUTION OF F.T.E. JOBS, BY REGION, 1981-86

HOULY WAGE LEVEL*	1. ATLANTIC		2. QUEBEC		3. ONTARIO	
	1986 DISTRIBUTION	CHANGE IN SHARE 81-86	1986 DISTRIBUTION	CHANGE IN SHARE 81-86	1986 DISTRIBUTION	CHANGE IN SHARE 81-86
1	17.5	3.2	12.2	3.0	11.4	1.4
2	12.9	1.5	9.4	-0.8	8.8	-0.4
3	11.6	0.0	8.4	-2.0	8.5	-2.1
4	12.1	-0.2	9.9	-0.2	9.4	-1.4
5	9.5	-0.6	10.3	-0.3	9.7	-0.7
6	7.5	-1.7	10.6	0.6	8.7	-1.9
7	8.9	1.1	10.1	1.2	11.1	2.3
8	7.8	-0.6	10.5	0.1	11.1	-0.4
9	7.4	-0.8	11.0	0.5	11.5	1.7
10	4.8	-1.8	7.6	-2.1	9.8	-1.5
	4. MANITOBA/SASKATCHEWAN		5. ALBERTA		6. BRITISH COLUMBIA	
1	13.1	4.4	10.4	2.7	11.3	5.4
2	11.7	0.0	8.3	0.0	7.2	0.3
3	8.5	-3.4	8.1	-2.2	6.6	-1.9
4	12.7	2.3	10.4	1.5	9.7	2.4
5	10.2	-0.6	9.7	-0.1	7.8	-1.2
6	9.4	-1.2	9.6	-0.8	9.6	-0.3
7	9.8	0.2	9.9	0.5	11.0	1.6
8	9.4	-0.5	11.1	-0.3	13.6	0.7
9	9.4	-0.5	13.1	1.4	14.4	-3.5
10	5.7	-0.9	9.6	-2.5	8.7	-3.6

* SEE TABLE A-1 FOR DESCRIPTION

TABLE A-29

Change in the Wage Distribution of Full-time Jobs
by Region and Age, 1981-86

Hourly Wage Level	16-24	25-34	35-49	50+
	Change in Share, 1981-86			
1. Atlantic Canada				
1-2	20.5	5.7	1.3	-2.1
3-4	-8.1	6.1	-0.6	2.0
5-6	-5.1	-1.6	-2.2	-3.1
7-8	-3.7	-0.2	0.4	2.6
9-10	-3.6	-10.0	1.1	0.6
2. Quebec				
1-2	19.0	0.3	1.3	-2.9
3-4	-5.9	1.7	-2.7	-1.5
5-6	-6.4	6.0	-0.6	-1.9
7-8	-4.3	-0.3	3.7	1.2
9-10	-2.3	-7.7	-1.7	5.1
3. Ontario				
1-2	13.5	1.8	-2.2	-3.2
3-4	-0.1	0.1	-5.4	-6.7
5-6	-5.3	-1.5	-1.6	-3.9
7-8	-4.4	3.1	1.8	4.4
9-10	-3.6	-3.5	7.6	9.4
4. Manitoba & Saskatchewan				
1-2	18.3	3.1	3.1	-3.3
3-4	-1.4	1.6	-1.1	-1.7
5-6	-8.5	2.7	-1.7	-1.5
7-8	-3.3	-1.7	-1.2	2.7
9-10	-5.0	-5.7	1.0	3.7
5. Alberta				
1-2	22.0	-1.3	-1.4	-4.4
3-4	5.4	2.8	-4.3	-1.9
5-6	-7.4	0.6	2.6	-0.2
7-8	-10.8	5.2	-0.6	4.6
9-10	-9.1	-7.4	3.8	2.0
6. British Columbia				
1-2	20.6	3.9	1.2	4.6
3-4	1.2	6.1	-1.0	-1.9
5-6	-5.3	4.0	-3.6	-1.3
7-8	-6.2	2.4	7.8	-1.4
9-10	-10.3	-16.3	-4.6	-0.1

TABLE A-30 CHANGE IN RELATIVE MEAN WAGES, BY AGE GROUP, 1977-86

	RELATIVE MEAN				CHANGE IN RELATIVE MEAN WITH 1981 AS THE BASE			
	15-19	20-24	25-34	45-54	15-19	20-24	25-34	45-54
FULL-TIME EARNERS								
1977	0.5722	0.7335	0.9935	1.0981	16.93	1.64	0.82	-1.56
1979	0.5519	0.7305	1.0063	1.1008	12.78	1.22	2.11	-1.32
1981 = 100	0.4894	0.7217	0.9855	1.1155	0.00	0.00	0.00	0.00
1982	0.4168	0.6991	0.9598	1.1201	-14.82	-3.13	-2.61	0.41
1984	0.3853	0.6518	0.9704	1.0968	-21.27	-9.69	-1.53	-1.68
1985	0.4103	0.6395	0.9502	1.1079	-16.15	-11.38	-3.58	-0.69
1986	0.4130	0.6253	0.9448	1.1242	-15.61	-13.35	-4.13	0.78
ALL EARNERS								
1977	0.2988	0.7158	1.1060	1.2752	19.45	0.69	1.19	0.28
1979	0.2961	0.7100	1.1219	1.2633	18.39	-0.12	2.64	-0.65
1981 =100	0.2501	0.7109	1.0930	1.2716	0.00	0.00	0.00	0.00
1982	0.2199	0.6441	1.0680	1.2997	-12.08	-9.40	-2.29	2.21
1984	0.1852	0.5883	1.0634	1.2681	-25.94	-17.25	-2.71	-0.27
1985	0.2033	0.5783	1.0496	1.2891	-18.72	-18.66	-3.97	1.38
1986	0.2074	0.5859	1.0408	1.3092	-17.09	-17.59	-4.78	2.96

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